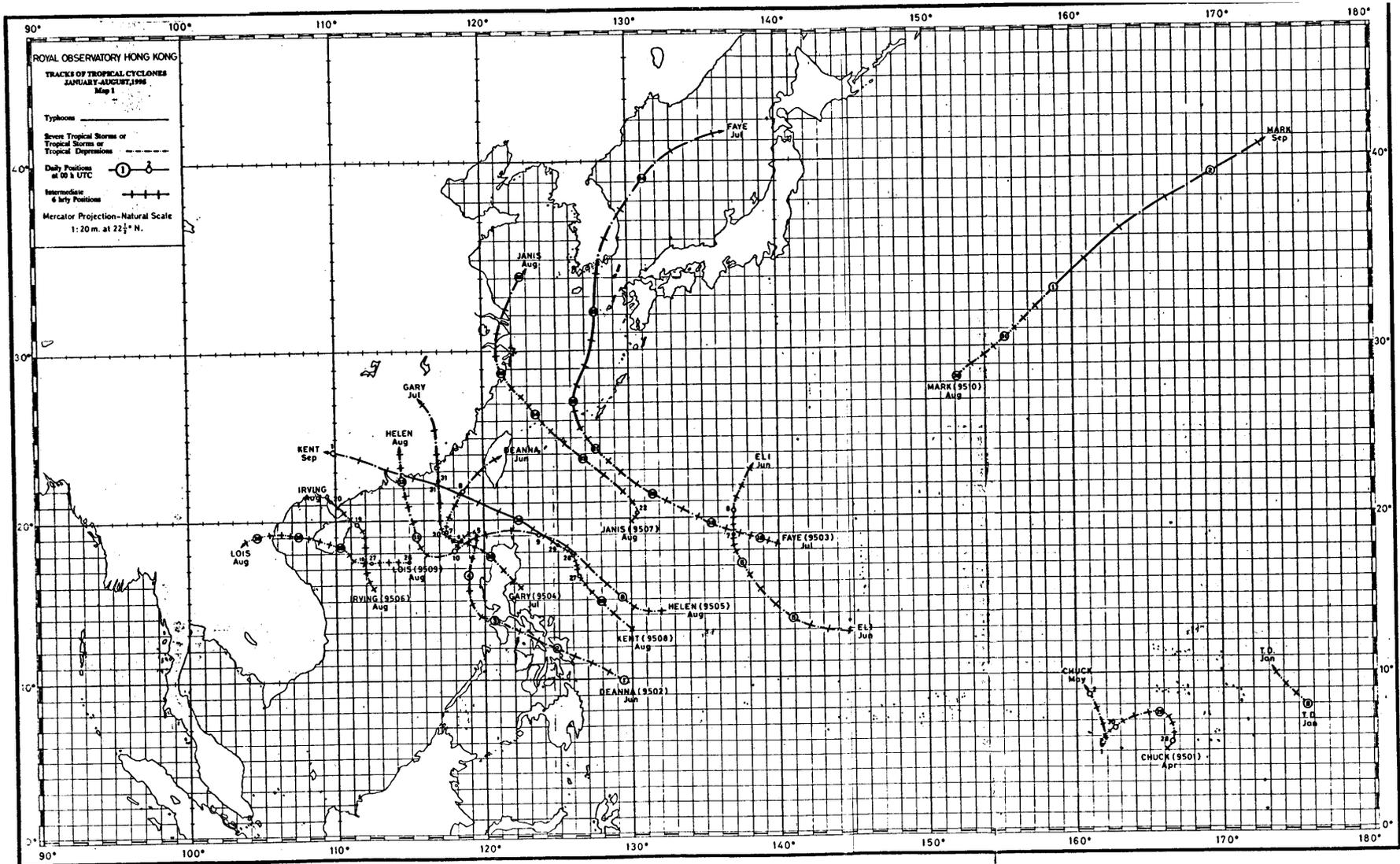


**ROYAL OBSERVATORY HONG KONG**

**TROPICAL CYCLONES IN  
1995**



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Prepared by :  
Royal Observatory  
134A Nathan Road  
Kowloon  
Hong Kong

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## Hong Kong's Tropical Cyclone Warning Signals

Signal		Display		Meaning of the Signal
		Symbol	Lights	
Stand By	1		White White White	A tropical cyclone is centred within about 800 kilometres of Hong Kong and may later affect Hong Kong.
Strong Wind	3		Green White Green	Strong wind is expected or blowing in the Victoria harbour, with a sustained speed of 41-62 kilometres per hour (km/h), and gusts which may exceed 110 km/h.
NW'ly Gale or Storm	8NW		White Green Green	Gale or storm force wind is expected or blowing in the Victoria harbour, with a sustained wind speed of 63-117 km/h from the quarter indicated and gusts which may exceed 180 km/h.
SW'ly Gale or Storm	8SW		Green White White	
NE'ly Gale or Storm	8NE		Green Green White	
SE'ly Gale or Storm	8SE		White White Green	
Increasing Gale or Storm	9		Green Green Green	Gale or storm force wind is increasing or expected to increase significantly in strength.
Hurricane	10		Red Green Red	Hurricane force wind is expected or blowing, with sustained speed reaching upwards from 118 km/h and with gusts that may exceed 220 km/h.

## **Section 1**

# **INTRODUCTION**

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

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 Director's Annual Departmental Reports from 1947 to 1967 inclusive. The series "Meteorological Results Part III - Tropical Cyclone Summaries" was subsequently introduced. It contained information on tropical cyclones over the western North Pacific and the South China Sea. The first issue, which contained reports on tropical cyclones occurring in 1968, was published in 1971. Tropical cyclones within the area bounded by the Equator, 45°N, 100°E and 160°E were described. With reconnaissance aircraft reports (terminated from August 1987 onwards) and satellite pictures facilitating the tracking of tropical cyclones over the otherwise data-sparse ocean, the eastern boundary of the area of coverage was extended from 160°E to 180° from 1985 onwards. Starting from 1987, the series was re-titled as "Tropical Cyclones in 19YY" but its contents remained largely the same.

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. Before 1961, only daily positions were plotted on the tracks. The time of the daily positions varied to some extent in the older publications but remained fixed at 0000 UTC after 1944. Details of the variation are given in the Royal Observatory 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 have been prepared since 1960 to meet the immediate needs of the press, shipping companies and others. These reports are printed and supplied on request. Initially, reports were only written on those tropical cyclones for which gale or storm signals had been hoisted in Hong Kong. By 1968, it had become necessary to produce a report on every tropical cyclone that necessitated the hoisting of tropical cyclone warning signals.

In this publication, tropical cyclones are classified into the following four categories according to the maximum sustained surface winds near their centres :

- A TROPICAL DEPRESSION (T.D.) has maximum sustained winds of less than 63 km/h.
- A TROPICAL STORM (T.S.) has maximum sustained winds in the range 63-87 km/h.
- A SEVERE TROPICAL STORM (S.T.S.) has maximum sustained winds in the range 88 - 117 km/h.
- A TYPHOON (T.) has maximum sustained winds of 118 km/h or more.

Throughout this publication, maximum sustained surface winds when used without qualification refer to wind speeds averaged over a period of 10 minutes. Mean hourly 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.

Over the western North Pacific and the South China Sea, tropical cyclone names are assigned by the Joint Typhoon Warning Center in Guam according to a pre-determined list that undergoes revisions from time to time. Since 1981, a common system for identification of tropical cyclones in the western North Pacific and the South China Sea has been adopted and the Japan Meteorological Agency is delegated with the responsibility of assigning to each tropical cyclone of tropical storm intensity or above a numerical code of four digits. For example, the first tropical cyclone of tropical storm intensity or above which occurred within the region in 1995 was assigned the code "9501". In this publication, the appropriate code immediately follows the name of the tropical cyclone in bracket, e.g. Tropical Storm Chuck (9501).

Surface wind data presented in this report were obtained from a network of anemometers operated by the Royal Observatory. Details of the stations are listed on the next page:

Station	Position		Head of anemometer above M.S.L. (m)
	Latitude N	Longitude E	
Central (Star Ferry Pier)	22°17'	114°10'	17
Cheung Chau	22°12'	114°01'	92
Cheung Sha Wan	22°20'	114°09'	30
Green Island	22°17'	114°07'	105
Hong Kong Airport (SE)	22°19'	114°13'	16
King's Park	22°19'	114°10'	78
Lau Fau Shan	22°28'	113°59'	50
Ping Chau	22°33'	114°26'	39
Sai Kung	22°23'	114°16'	31
Sha Lo Wan	22°18'	113°54'	71
Sha Tin	22°24'	114°12'	16
Star Ferry Pier Kowloon	22°18'	114°10'	18
Ta Kwu Ling	22°32'	114°09'	28
Tai Mei Tuk	22°29'	114°14'	71
Tai Mo Shan	22°25'	114°07'	969
Tai Po Kau	22°27'	114°11'	28
Tap Mun	22°28'	114°21'	37
Tate's Cairn	22°22'	114°13'	588
Tseung Kwan O	22°19'	114°15'	52
Tsing Yi (Ching Pak House)	22°21'	114°06'	136
Tuen Mun	22°24'	113°58'	68
Waglan Island	22°11'	114°18'	82
Wan Chai	22°17'	114°10'	378
Wong Chuk Hang	22°15'	114°10'	30

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.

In Section 2, an overall review of all the tropical cyclones over the western North Pacific and the South China Sea in 1995 is presented.

The reports in Section 3 are individual accounts of the life history of tropical cyclones affecting Hong Kong in 1995. 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 barometric pressure recorded at the Royal Observatory;
- (e) the daily amounts of rainfall recorded at the Royal Observatory and selected locations;
- (f) the times and heights of the highest tides and maximum storm surges recorded in Hong Kong;
- (g) satellite pictures and/or radar displays if applicable.

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 are tabulated in Section 5.

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

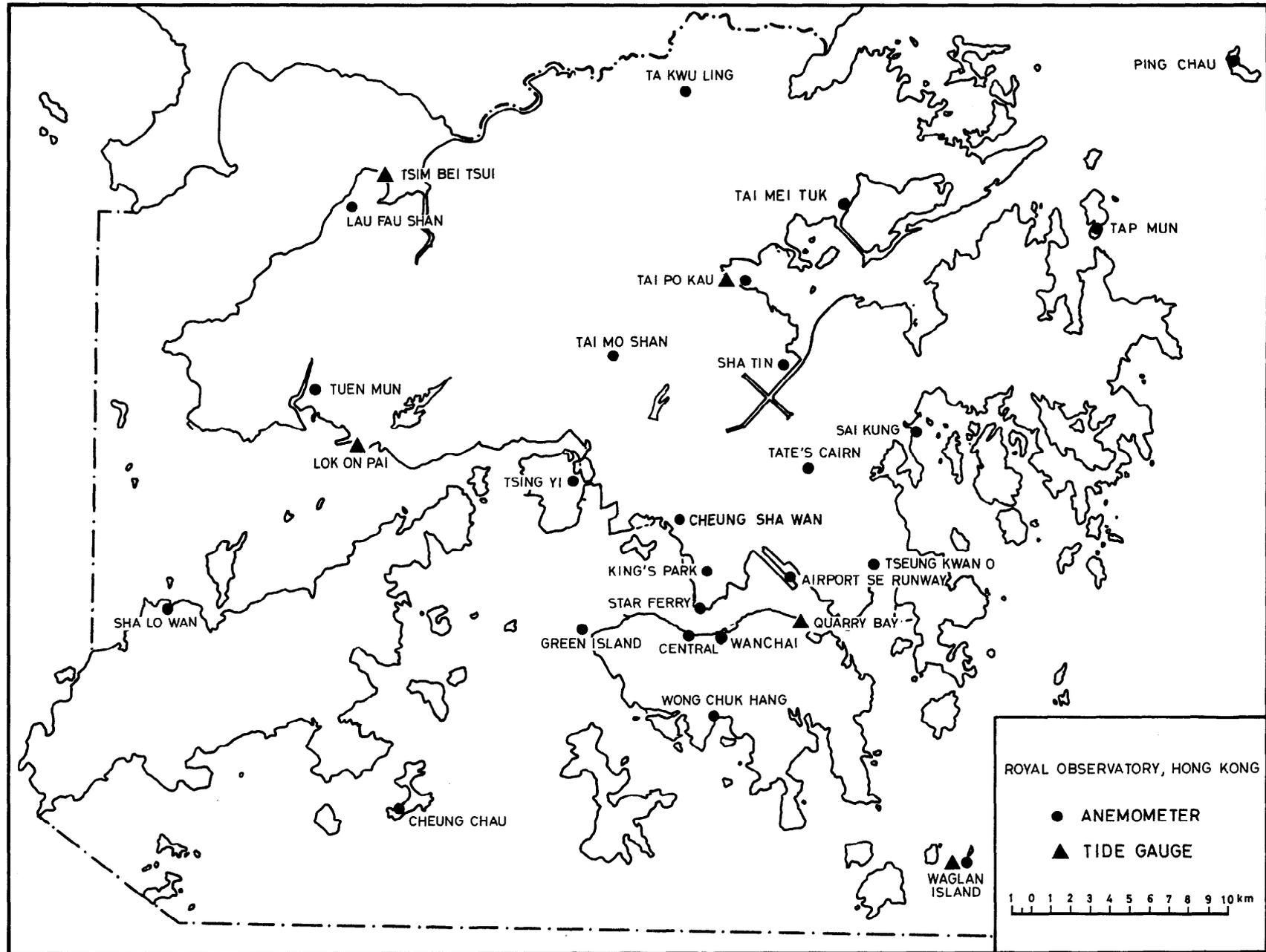


Figure 1. Locations of anemometers and tide gauge stations mentioned in this report.

## **Section 2**

# **TROPICAL CYCLONE OVERVIEW FOR 1995**

In 1995, there were 29 tropical cyclones over the western North Pacific and the adjacent seas bounded by the equator, 45°N, 100°E and 180°. Compared with the 30-year annual average (1961- 1990) of 31 tropical cyclones, 1995 was a year with slightly below normal tropical cyclone activity. Also, the number of tropical cyclones attaining typhoon intensity was below-normal - a total of 10 typhoons in 1995 against the 30-year annual average of 15.6. The monthly distributions of the frequency of first occurrence of tropical cyclones and that of typhoons for 1995 are shown in Figure 2. The monthly mean frequencies of these two parameters during the years 1961 - 1990 are shown in Figure 3.

A total of six tropical cyclones hit the coast of Guangdong in 1995. Amongst these Severe Tropical Storm Gary (9504) Severe Tropical Storm Helen (9505) and Typhoon Kent (9508) affected Hong Kong. In contrast, tropical cyclone activity was relatively quiet over the east China coast, Taiwan, Korea and Japan, each region being visited by only one landfalling cyclone over the year.

To the south, eight storms traversed the Philippines during the year, including the killer typhoon Angela (9520). Two of them hit Vietnam in the late season after crossing the South China Sea.

During the year, 17 tropical cyclones occurred within the area of responsibility of Hong Kong (i.e. the area bounded by 10°N, 30°N, 105°E and 125°E). This number was near the 30-year (1961-90) annual average of 16.4. Of the 17 tropical cyclones, seven developed within Hong Kong's area of responsibility. Altogether, 466 tropical cyclone warnings to ships and vessels were issued by the Royal Observatory in 1995 (Table 2).

Local warning signals were hoisted in Hong Kong for eight tropical cyclones. While Gary (9504) Irving (9506) Lois (9509) Nina (9511) and Ryan (9514) necessitated only the Stand By Signal No. 1, the No.8 Gale or Storm Signal was displayed for Helen (9505) Kent (9508) and Sibyl (9515). August 1995 was the first August since 1946 when the No. 8 signal had to be hoisted twice within the month.

The total tropical cyclone rainfall (defined as the total rainfall recorded at the Royal Observatory from the time when a tropical cyclone was centred within 600 km of Hong Kong to 72 hours after the tropical cyclone has dissipated or moved outside 600 km of Hong Kong) in 1995 amounted to 1 550.5 mm, over twice the mean annual value of 741.0 mm (1961 - 1990). It accounted for 56 per cent of the year's total rainfall of 2 754.4 mm. Rainfall figures associated with those tropical cyclones coming within 600 km of Hong Kong, altogether ten, are given in Table 8(a).

A review of all the tropical cyclones in 1995 is given in the following paragraphs.

A short-lived tropical depression occurred near the International Date Line in January. This tropical depression formed about 1 580 km southeast of Wake Island on the morning of 8 January. Moving northwestwards at about 20 km/h, it dissipated over water early the next morning.

Over the western North Pacific, Chuck (9501) developed as a tropical depression about 1 600 km east of Truk Island on 28 April, heading northwards initially. It adopted a westward track and deepened to a tropical storm the next day. Chuck turned southwestwards on 30 April. It then made an anticlockwise loop while weakening to a tropical depression. Chuck took a north-northwestward track on 1 May and dissipated over water the following day.

There were two tropical cyclones over the South China Sea and the western North Pacific in June.

Tropical Storm Deanna (9502) developed over the coastal waters of the Philippines about 1 060 km east-southeast of Manila on 1 June. Moving west-northwestwards at about 20 km/h, it intensified to a tropical storm on 3 June while entering the South China Sea. Deanna then headed northwards until it became slow-moving on 5 June. Picking up speed towards the northeast on 8 June, Deanna weakened to a tropical

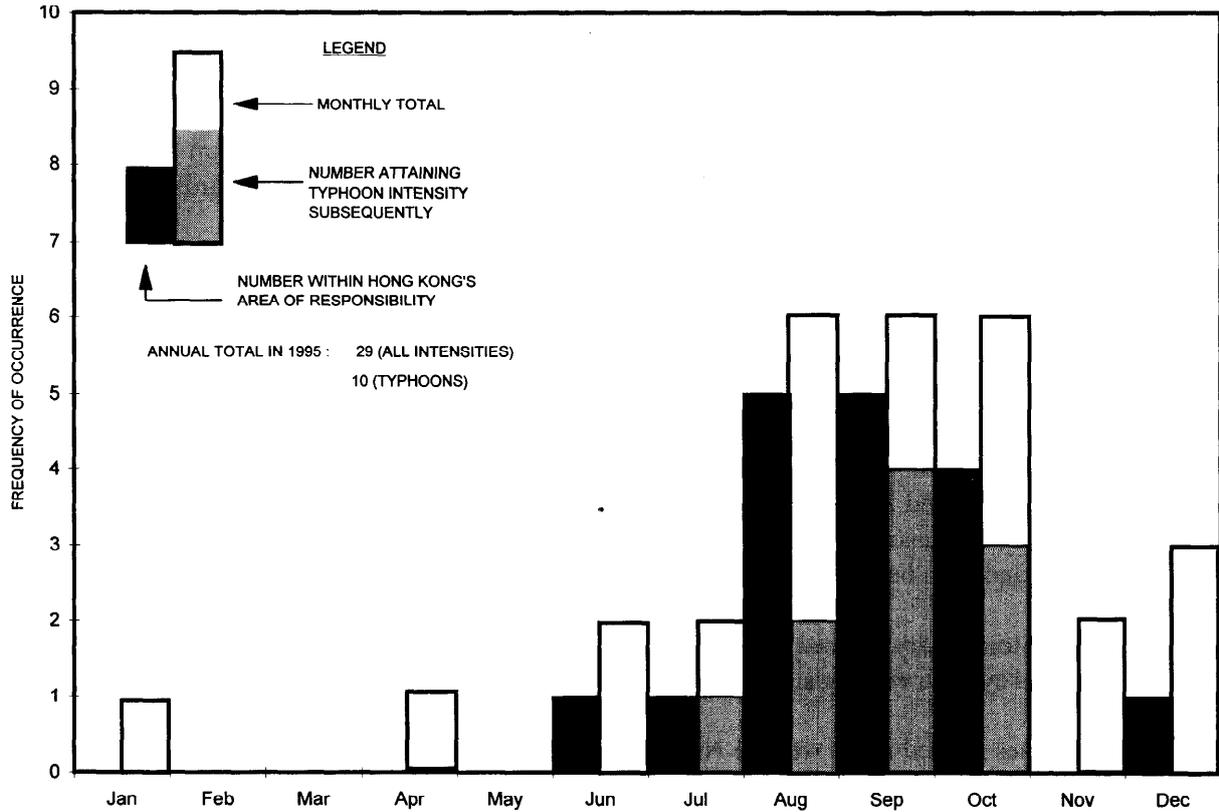


Figure 2. Monthly distribution of the frequency of first occurrence of tropical cyclones in the western North Pacific and the South China Sea in 1995.

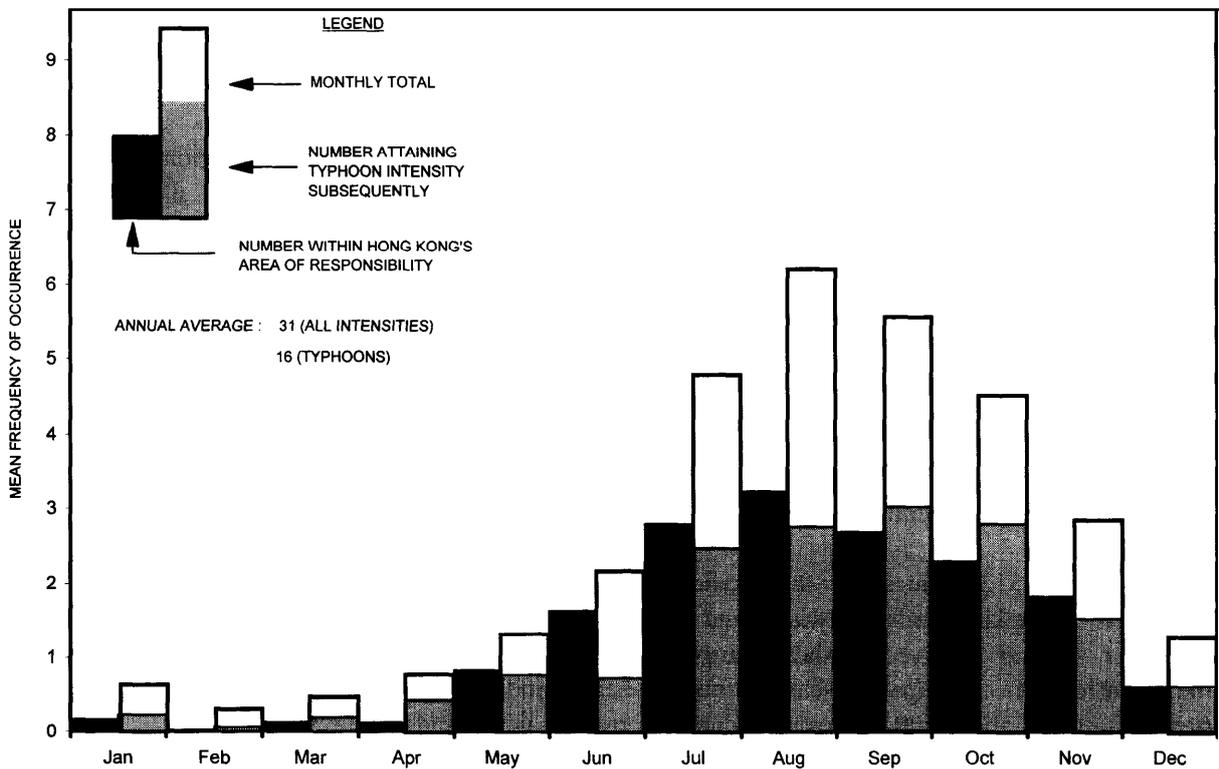


Figure 3. Monthly distribution of the mean frequency of first occurrence of tropical cyclones in the western North Pacific and the South China Sea, 1961-1990.

depression over the South China Sea and dissipated that night after making landfall over Taiwan. Deanna and its remnant brought heavy rain to Taiwan, causing widespread flooding. Damage to agricultural produce was estimated at over NT\$ 410 million.

Over the Pacific, an area of disturbance formed as Tropical Depression Eli about 80 km south-southwest of Guam on 4 June. It moved west-northwestwards at first and recurved north-northeastwards over the next few days. Eli weakened to an area of low pressure on the morning of 9 June.

Two tropical cyclones, Faye (9503) and Gary (9504) occurred over the western North Pacific and the South China Sea in July.

Faye developed as a tropical depression about 760 km northwest of Guam on 17 July. Heading west-northwestwards, it intensified progressively and attained typhoon strength on 21 July. After traversing the Ryukyus, Faye recurved north-northeastwards the next day. It made landfall on 23 July over Korea where at least 16 people were killed and 27 were reported missing. An oil tanker also ran aground near the southern port of Yosue. Having first weakened to a severe tropical storm, Faye entered the Sea of Japan on 24 July. There it lost strength further and soon became extratropical.

Severe Tropical Storm Gary formed about 210 km northeast of Manila on 27 July. It necessitated the hoisting of the tropical cyclone warning signal in Hong Kong. A detailed report on Gary is presented in Section 3.

Six tropical cyclones formed in the western North Pacific and the South China Sea in August. Four of them, Severe Tropical Storm Helen (9505) Tropical Storm Irving (9506) Typhoon Kent (9508) and Severe Tropical Storm Lois (9509) necessitated the hoisting of tropical cyclone warning signals in Hong Kong in the month. Detailed reports on these four tropical cyclones are presented in Section 3.

Janis (9507) developed as a tropical depression about 740 km south-southeast of Okinawa on the night of 21 August and intensified into a tropical storm early the next morning. Moving northwestwards, it made landfall about 100 km east-northeast of Wenzhou on 25 August. Janis then turned north-northeastwards, entering the Yellow Sea on 26 August and dissipated over water. In Zhejiang Janis brought heavy rain but no significant damage was reported.

The last tropical cyclone in August was Mark (9510). Forming as a tropical depression about 1 800 km north-northeast of Guam on 30 August, it deepened into a tropical storm the next day while heading northeastwards over the Pacific. Mark intensified gradually and attained typhoon strength on 2 September. It then weakened and became extratropical the following day.

Tropical Storm Nina (9511) and Typhoon Ryan (9514) necessitated the hoisting of tropical cyclone warning signals in September. Detailed reports on Nina and Ryan are presented in Section 3.

An area of low pressure deepened into a tropical depression about 410 km south-southeast of Xisha on 9 September. Moving in a general direction towards the west, the tropical depression dissipated over water on the early morning of 11 September.

Typhoon Oscar (9512) formed over the Pacific about 380 km east-northeast of Guam on the early morning of 12 September. Tracking northwestwards and intensifying over water, Oscar attained typhoon strength on 14 September. Oscar recurved northeastwards two days later, skirted past Honshu on 17 September and became extratropical. In Japan, Oscar claimed nine lives and injured at least 13 people. Six people were reported missing and about 600 houses were damaged by high winds and flood water.

Another tropical cyclone named Polly (9513) developed about 390 km northeast of Manila on 15 September. It moved east-northeastwards and intensified into a severe tropical storm about 670 km southwest of Iwo Jima on 17 September. Polly adopted a northwards course and intensified into a typhoon the next day. Accelerating northeastwards over the Pacific, Polly became extratropical on 22 September.

Typhoon Sibyl (9515) which formed on 28 September and affected Hong Kong in October was the last tropical cyclone necessitating the hoisting of tropical cyclone warning signals in this year. A detailed report on Sibyl is presented in Section 3.

Six tropical cyclones formed over the western North Pacific and the South China Sea in October.

A tropical depression named Ted (9516) formed about 520 km east-southeast of Xisha on 9 October, moving westwards initially. It intensified into a tropical storm two days later and then turned north-northeastwards. Moving across Beibu Wan, Ted made landfall over Guangxi on 13 October and wreaked havoc there. At least 61 people were killed and 162 were injured. About 176 000 houses were damaged and more than five million hectares of farmland were affected. The direct economic loss amounted to 3.6 billion RMB.

Shortly after Ted's formation, another tropical cyclone named Val (9517) developed over the Pacific about 440 km southeast of Iwo Jima on 10 October. Moving northwestwards, Val deepened into a tropical storm the next day. After making a clockwise loop on 12 October, Val moved southwards. It then dissipated over water on 13 October.

Ward (95 18) developed over the Pacific about 800 km east of Guam on 16 October. It intensified over water and attained typhoon strength on 18 October. Ward recurved northeastwards two days later and weakened into a severe tropical storm on the early morning of 22 October. It soon became extratropical over the Pacific.

A tropical disturbance developed into Tropical Depression Yvette (9519) about 1 080 km east-southeast of Manila on 23 October. After traversing the Philippines, it tracked westwards over the South China Sea on 24 October. Yvette intensified into a tropical storm the next day. It dissipated over land on the early morning of 27 October after making landfall over Vietnam.

Zack (9521) developed as a tropical depression about 920 km southwest of Guam on 25 October. Intensifying into a severe tropical storm on 28 October, it tracked westwards and rampaged across the Philippines. More than 160 people were killed in its wake. After entering the South China Sea on 29 October, Zack intensified further and attained typhoon strength the next day. It made landfall over Vietnam on the morning of 1 November and dissipated next morning. In Vietnam Zack claimed 14 people's lives, injured more than 80 others and destroyed some 26 000 houses.

While Zack was traversing the Philippines, Angela (9520) formed about 520 km southeast of Guam on 25 October. It moved in a general direction towards the west-northwest. After intensifying into a typhoon on 31 October, Angela approached the Philippines and devastated the islands. Nearly 800 people were found dead or missing, over 2 700 others were injured and at least 100 000 houses were destroyed. The economic loss in crops and infrastructure was put at more than US\$ 90 million. Angela entered the South China Sea on 3 November and weakened into a severe tropical storm the next day. Tracking northwestwards, it made landfall over Hainan Island and dissipated on 6 November.

Brian (9522) formed as a tropical depression about 1 040 km west of Wake Island on 1 November. Recurring northeastwards over the Pacific, it deepened into a tropical storm the next day, but quickly dissipated over water on 3 November.

Colleen developed as a tropical depression over the International Date Line on 11 November. It tracked south-southwestwards at first, but turned west-northwestwards and dissipated two days later.

Three tropical cyclones occurred over the western North Pacific and the South China Sea in December.

A tropical depression formed over the Pacific about 560 km east of Manila on 3 December. Moving south-westwards, it approached the Philippines and dissipated as an area of low pressure the next day. This tropical depression and its remnant brought torrential downpours to the islands. At least 20 people were killed in the landslides caused by heavy rain.

Another tropical depression formed over the South China Sea about 950 km south-southeast of Xisha on 9 December. Moving westwards, it dissipated over water on 11 December.

The last tropical cyclone in 1995, Dan (9523) formed as a tropical depression over the Pacific about 1 310 km west-southwest of Guam on 25 December. Recurving slowly, it intensified over water and became a severe tropical storm on 28 December. Dan then accelerated northeastwards and weakened, becoming extratropical on 31 December.

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

## **Section 3**

# **REPORTS ON TROPICAL CYCLONES AFFECTING HONG KONG IN 1995**

**(a) Severe Tropical Storm Gary (9504)****27 July - 1 August 1995**

The track of Gary is shown in Figure 4

On 27 July, an area of low pressure near the Philippines deepened into a tropical depression named Gary as it was about 210 km northeast of Manila. Torrential downpours associated with Gary triggered off flash floods on Luzon. Mudflows from Mount Pinatubo also caused extensive damage to houses and dykes.

Heading northwestwards at 20 km/h, Gary entered the South China Sea on 28 July. It became slow-moving the next day and deepened to a tropical storm. Gary intensified further to a severe tropical storm on the afternoon of 30 July while accelerating northwards near Dongsha. Continuing its movement at 30 km/h, Gary made landfall near Shantou about 320 km east-northeast of Hong Kong on the afternoon of 31 July. It then moved further inland and dissipated the next morning.

The fury of Gary claimed four lives in Shantou. 319 000 people were affected and 3 000 houses were damaged. The total economic loss was estimated at 200 million RMB. The circulation of Gary also affected Taiwan where four fishing vessels sank, with two people dead and 19 missing.

In Hong Kong the Stand By Signal No. 1 was hoisted at 3.45 p.m. on 28 July when Gary was about 730 km to the southeast, moving steadily northwestwards at 12 km/h. Apart from some showers, the weather stayed mainly fine with light to moderate northeasterly winds as Gary slowed down to the southeast of Dongsha. Winds gradually turned northerly when Gary started accelerating northwards towards the coast. Gary was closest to the territory at around 8 a.m. on 31 July when it was about 290 km to the east. The No. 1 signal was lowered at 2.30 p.m. that afternoon after Gary made landfall near Shantou. At the Royal Observatory Headquarters, the lowest hourly sea-level pressure of 996.7 hPa was recorded at 4 a.m. on 31 July.

No significant damage was reported in Hong Kong during the passage of Gary. However, Gary's outer rainbands brought squally thunderstorms on the evening of 31 July, causing power disruption to the Mass Transit Railway services at Kowloon Bay and Ngau Tau Kok. The unstable southwesterlies in the wake of Gary also brought heavy rain and thunderstorms to the territory on 3 August, on which day more than 30 flooding incidents and 17 cases of landslips were reported.

The rainfall distribution associated with Gary is shown in Figure 5. Information on wind, rainfall and tide during the passage of Gary is given as follows :

Maximum gust peak speeds and maximum hourly mean winds with associated wind directions recorded at various stations during the hoisting of tropical cyclone warning signal for Gary :-

<u>Station (see Fig. 1)</u>	<u>Maximum Gust</u>			<u>Maximum Hourly Wind</u>					
	<u>Direction</u>	<u>Speed (km/h)</u>	<u>Date</u>	<u>Time</u>	<u>Direction</u>	<u>Speed (km/h)</u>	<u>Date</u>	<u>Time</u>	
Central	<b>ENE</b>	40	30 Jul	0330	<b>E</b>	19	30 Jul	0400	
Cheung Chau	<b>WSW</b>	52	31 Jul	1206	<b>WSW</b>	30	31 Jul	1400	
Cheung Sha Wan	<b>ENE</b>	40	30 Jul	0312	<b>WSW</b>	14	31 Jul	1200	
H.K. Airport (SE)	<b>W</b>	49	31 Jul	1140	<b>WSW</b>	30	31 Jul	0600	
					<b>W</b>	30	31 Jul	1100	
					<b>W</b>	30	31 Jul	1200	
King's Park	<b>E</b>	34	30 Jul	0131	<b>W</b>	12	31 Jul	1000	
	<b>ESE</b>	34	30 Jul	0141	<b>W</b>	12	31 Jul	1200	
Lau Fau Shan	<b>WNW</b>	92	31 Jul	1150	<b>W</b>	38	31 Jul	1100	
					<b>W</b>	38	31 Jul	1200	
Ping Chau	<b>WNW</b>	36	31 Jul	0832	<b>WNW</b>	19	31 Jul	0900	
Sai Kung	<b>WNW</b>	52	31 Jul	1220	<b>NW</b>	23	31 Jul	0700	
Sha Tin	<b>W</b>	49	31 Jul	1217	<b>E</b>	13	30 Jul	0200	

Station (see Fig. 1)	Maximum Gust			Maximum Hourly Wind				
	Direction	Speed (km/h)	Date	Time	Direction	Speed (km/h)	Date	Time
Star Ferry	E	43	30 Jul	0347	W	27	31 Jul	1200
Ta Kwu Ling	WNW	40	31 Jul	1116	WNW	16	31 Jul	1200
Tai Mei Tuk	W	68	31 Jul	1216	W	22	31 Jul	1300
Tai Mo Shan	W	92	31 Jul	1206	ENE	54	29 Jul	0400
Tai Po Kau	W	70	31 Jul	1211	W	19	31 Jul	1200
Tap Mun	WNW	49	31 Jul	0842	WNW	31	31 Jul	0700
Tate's Cairn	WNW	87	31 Jul	1217	E	38	30 Jul	0300
Tseung Kwan O	N	40	31 Jul	1229	N	13	30 Jul	1000
Tsing Yi	WNW	58	31 Jul	1106	WNW	23	31 Jul	1200
Tuen Mun	ESE	58	30 Jul	0112	ESE	20	30 Jul	0200
Waglan Island	WNW	65	31 Jul	0829	W	45	31 Jul	1200
Wan Chai	WSW	79	31 Jul	1119	W	52	31 Jul	1100
Wong Chuk Hang	E	58	30 Jul	0342	E	23	30 Jul	0300
					E	23	30 Jul	0400

Stations with no record :  
Green Island  
Sha Lo Wan

Daily rainfall amounts in millimetres recorded at the Royal Observatory and other stations during the passage of Gary :-

Station (see Fig. 5)	28 Jul	29 Jul	30 Jul	31 Jul	1 Aug	Total
Royal Observatory	4.2	Nil	Trace	20.3	7.2	31.7
H19 (HK Island (east))	9.0	Nil	3.0	12.0	59.0	83.0
H13 (HK Island (west))	5.5	Nil	Nil	24.0	20.0	49.5
H21 (HK Island (south))	10.0	Nil	2.0	4.0	42.0	58.0
K04 (Kowloon (east))	5.0	Nil	Nil	19.5	[9.5]	[34.0]
K06 (Kowloon (west))	7.0	Nil	Nil	13.5	2.5	23.0
N17 (Lantau)	5.5	Nil	2.0	15.5	1.0	24.0
N13 (Sai Kung)	[2.5]	Nil	6.0	22.5	15.0	[46.0]
N09 (Sha Tin)	11.5	Nil	0.5	22.5	11.0	45.5
R26 (Shek Kong)	4.0	Nil	0.5	27.5	Nil	32.0
N05 (Sheung Shui)	14.0	Nil	1.5	2.0	0.5	18.0
R31 (Tai Po)	13.5	Nil	2.0	Nil	3.5	19.0
N06 (Tsuen Wan - Kwai Chung)	4.5	Nil	Nil	1.5	4.5	10.5
R21 (Tuen Mun)	2.0	Nil	0.5	0.5	Nil	3.0
N12 (Yuen Long)	2.5	Nil	7.0	26.5	0.5	36.5

Note : [ ] based on incomplete hourly data.

Times and heights of the maximum-sea level and the maximum storm surge recorded at tide stations in Hong Kong during the passage of Gary :-

Station (see Fig. 1)	Maximum sea level above chart datum			Maximum storm surge above astronomical tide		
	Height (m)	Date	Time	Height (m)	Date	Time
Lok On Pai	2.49	30 Jul	10.55 a.m.	0.39	30 Jul	8.22 p.m.
Quarry Bay	2.43	30 Jul	10.21 a.m.	0.51	30 Jul	8.36 p.m.
Tsim Bei Tsui	2.80	30 Jul	11.22 a.m.	0.56	30 Jul	9.02 a.m.
Waglan Island	2.49	30 Jul	10.29 a.m.	0.57	30 Jul	8.06 p.m.

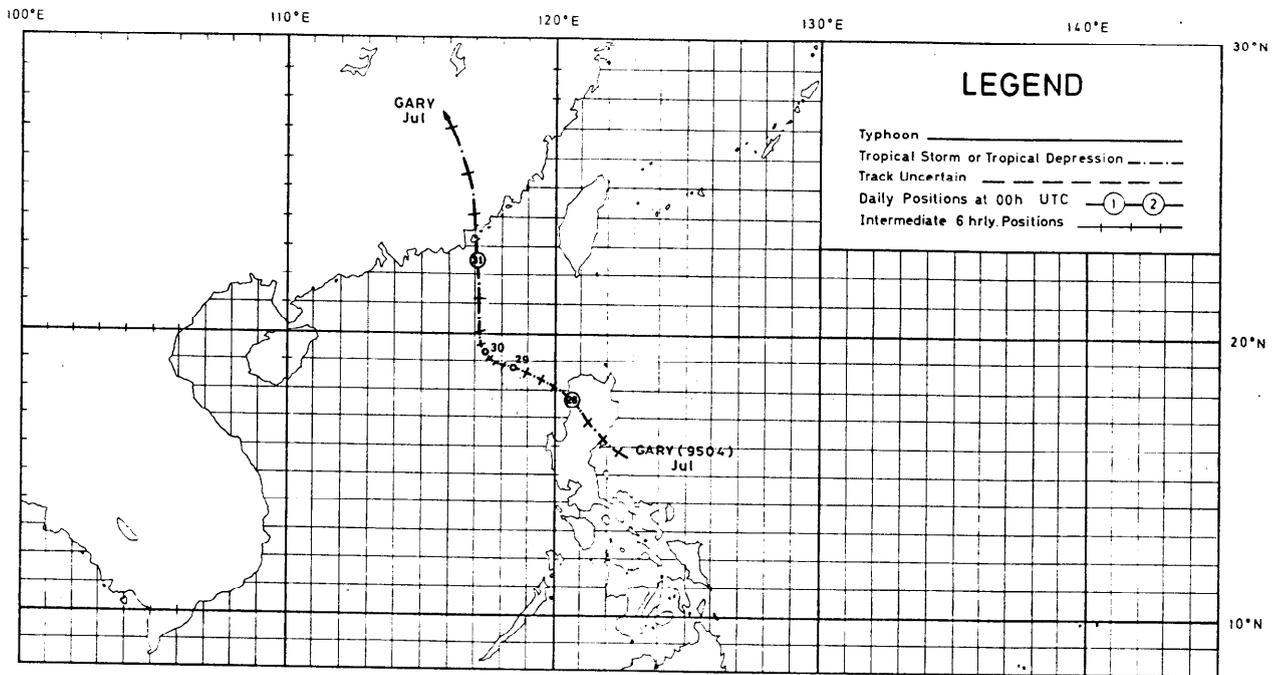


Figure 4. Track of Severe Tropical Storm Gary (9504) : 27 July - 1 August 1995.

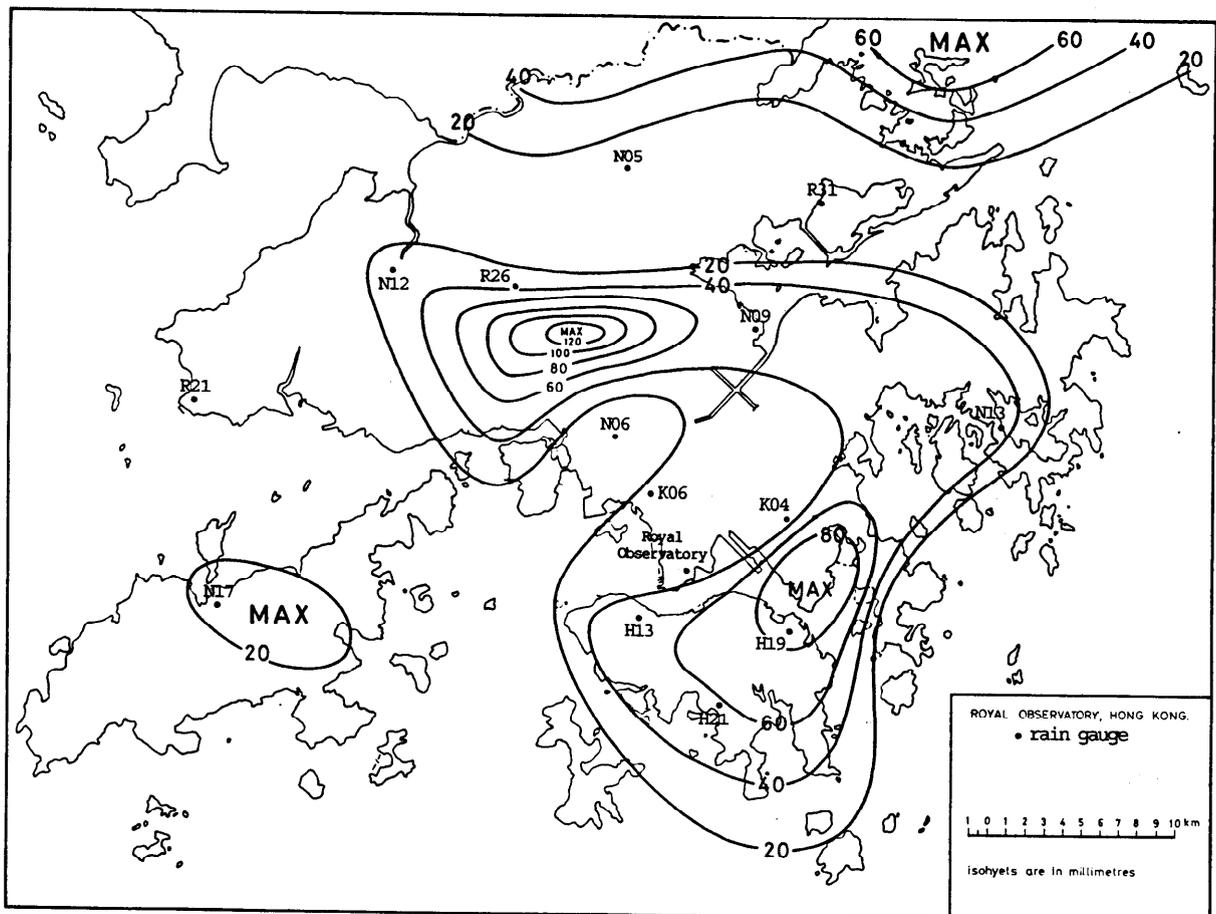


Figure 5. Rainfall distribution on 28 July - 1 August 1995.

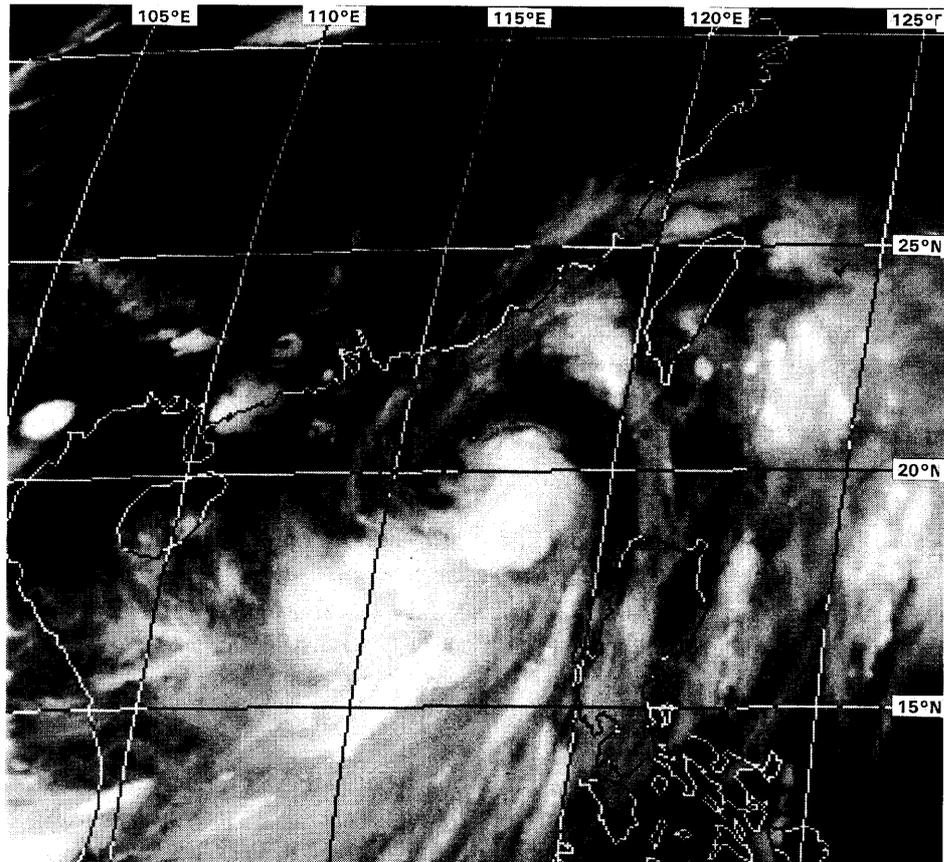


Figure 6. Infra-red imagery of Gary at around 8 p.m. on 30 July 1995 (originally captured by GMS of JMA).

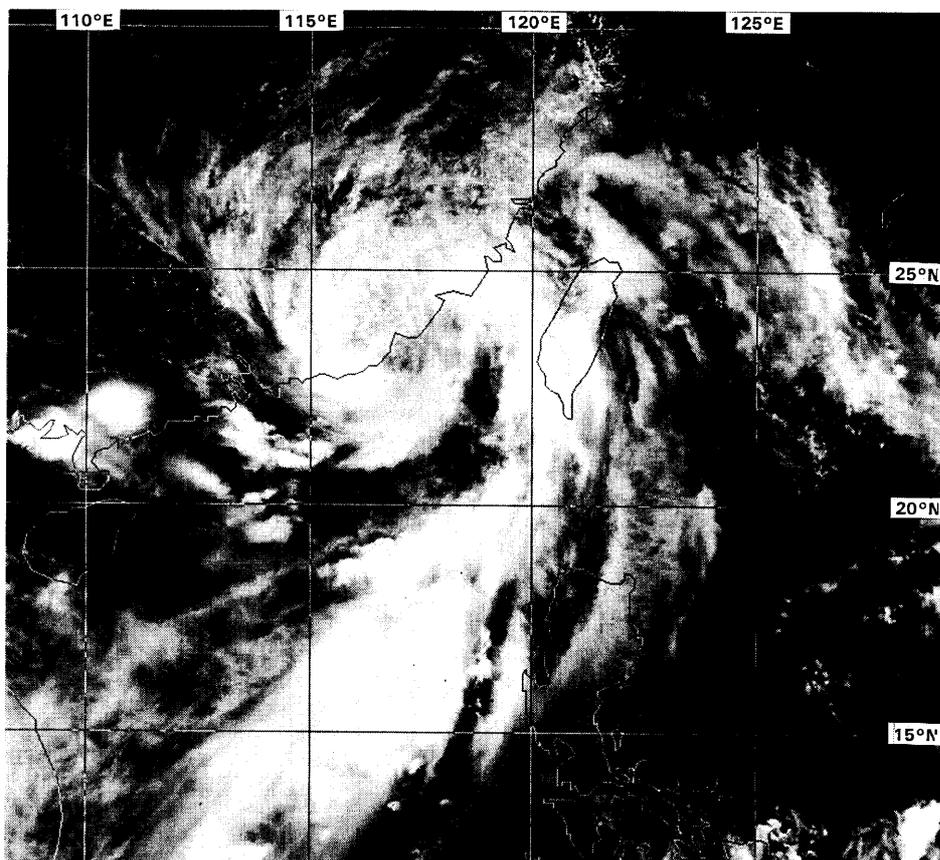


Figure 7. Visible imagery of Gary at around 11 a.m. on 31 July 1995 (originally captured by GMS of JMA).

**(b) Severe Tropical Storm Helen (9505)****7 - 12 August 1995**

The track of Helen is shown in Figure 8

Helen formed as a tropical depression over the western North Pacific about 1 190 km east of Manila on 7 August. Tracking northwestwards, it intensified into a tropical storm on 9 August and entered the South China Sea a day later. Helen intensified further to a severe tropical storm about 380 km south-southeast of Hong Kong on 11 August. It made landfall about 60 km northeast of Hong Kong the following morning. Over land, Helen weakened rapidly and dissipated in the evening.

In Guangdong Helen claimed 23 lives. About 54 000 houses were damaged or destroyed. The total economic loss was put at 1.33 billion RMB.

In Hong Kong the Stand By Signal No. 1 was hoisted at 4.00 p.m. on 9 August. Apart from some showers, the weather remained fine at the time. As Helen took on a north-northwestward track over the South China Sea, the Strong Wind Signal No.3 was hoisted at 5.45 a.m. on 11 August. Northeasterly winds started to strengthen and showers became more frequent. The No.8 NORTHEAST Gale or Storm Signal was hoisted at 10.30 p.m. that evening when Helen was about 140 km to Hong Kong's south-southeast. Gale force winds together with squally showers began to batter the territory.

As Helen passed to the east of Hong Kong, the No.8 NORTHEAST signal, was replaced by the No.8 NORTHWEST Gale or Storm Signal at 4.30 a.m. on 12 August and subsequently by the No.8 SOUTHWEST signal at 9.45 a.m. As local winds gradually subsided, the No.8 SOUTHWEST signal was replaced by the Strong Wind Signal No.3 at 2.15 p.m. All signals were lowered at 5.30 p.m. as Helen continued to weaken and move away from Hong Kong. Helen was closest to the territory at around 7 a.m. on 12 August when it was about 50 km to the east. At the Royal Observatory Headquarters, the lowest hourly sea-level pressure of 993.0 hPa was recorded at 7 a.m. on 12 August.

The high winds of Helen brought down trees and scaffoldings in many places over the territory, with 31 people suffering from minor injuries. Helen and its remnant brought heavy downpours to Hong Kong, causing widespread flooding. About 60 cases of landslips were reported. Many key roads were blocked as a result. Three people were killed and four injured in the serious landslips in Chai Wan and Aberdeen on 13 August. The passage of Helen also caused serious disruption to land, sea and air traffic.

The rainfall distribution associated with Helen is shown in Figure 9. Information on wind, rainfall and tide during the passage of Helen is given as follows :

Maximum gust peak speeds and maximum hourly mean winds with associated wind directions recorded at various stations during the hoisting of tropical cyclone warning signals for Helen :-

<u>Station</u> (see Fig. 1)	<u>Maximum Gust</u>			<u>Maximum Hourly Wind</u>					
	<u>Direction</u>	<u>Speed (km/h)</u>	<u>Date</u>	<u>Time</u>	<u>Direction</u>	<u>Speed (km/h)</u>	<u>Date</u>	<u>Time</u>	
Central	<b>WNW</b>	96	12 Aug	0711	<b>WNW</b>	43	12 Aug	0700	
Cheung Chau	<b>NW</b>	121	12 Aug	0643	<b>NW</b>	72	12 Aug	0800	
Cheung Sha Wan	<b>NE</b>	81	12 Aug	0051	<b>NE</b>	31	12 Aug	0200	
					<b>SW</b>	31	12 Aug	1300	
H.K. Airport (SE)	<b>WNW</b>	115	12 Aug	0717	<b>WNW</b>	62	12 Aug	0800	
King's Park	<b>ENE</b>	79	11 Aug	2350	<b>WNW</b>	31	12 Aug	0900	
	<b>NE</b>	79	12 Aug	0317					
Lau Fau Shan	<b>W</b>	113	12 Aug	1007	<b>WNW</b>	79	12 Aug	0900	
Ping Chau	<b>W</b>	110	12 Aug	0944	<b>W</b>	56	12 Aug	1000	
	<b>W</b>	110	12 Aug	0948					
Sai Kung	<b>NNE</b>	115	12 Aug	0344	<b>NNE</b>	63	12 Aug	0400	
Sha Lo Wan	<b>NW</b>	88	12 Aug	0617	<b>E</b>	40	11 Aug	1700	

Station (see Fig. 1)	Maximum Gust			Maximum Hourly Wind				
	Direction	Speed (km/h)	Date	Time	Direction	Speed (km/h)	Date	Time
Sha Tin	WSW	79	12 Aug	0952	NNE	27	12 Aug	0400
Star Ferry	WNW	94	12 Aug	0756	WNW	65	12 Aug	0900
Ta Kwu Ling	NW	81	12 Aug	0915	NNW	31	12 Aug	0900
Tai Mei Tuk	WSW	115	12 Aug	0832	NE	63	12 Aug	0100
Tai Mo Shan	SW	144	12 Aug	1110	W	96	12 Aug	0900
Tap Mun	W	112	12 Aug	0922	W	70	12 Aug	0900
Tseung Kwan O	NNE	106	12 Aug	0252	NNE	40	12 Aug	0400
Tsing Yi	W	115	12 Aug	1248	NW	59	12 Aug	0700
Tuen Mun	NW	104	12 Aug	0953	NW	36	12 Aug	0900
Waglan Island	NE	139	12 Aug	0351	NE	104	12 Aug	0400
	-	139	12 Aug	0958				
Wan Chai	WSW	149	12 Aug	1024	W	106	12 Aug	0900

Stations with no record :

Green Island

Tai Po Kau

Tate's Cairn

Wong Chuk Hang

Daily rainfall amounts in millimetres recorded at the Royal Observatory and other stations during and after the passage of Helen :-

Station (see Fig. 9)	9 Aug	10 Aug	11 Aug	12 Aug	13 Aug	14 Aug	Total
Royal Observatory	Nil	3.0	28.1	242.4	114.1	91.8	479.4
H19 (HK Island (east))	Nil	Nil	41.0	284.0	159.0	111.0	595.0
H13 (HK Island (west))	Nil	1.5	34.5	288.5	133.0	122.5	580.0
H21 (HK Island (south))	Nil	Nil	34.0	243.0	170.5	95.0	542.5
K04 (Kowloon (east))	Nil	3.0	[33.5]	220.5	82.0	81.0	[420.0]
K06 (Kowloon (west))	Nil	Nil	[25.0]	199.0	27.5	[78.0]	[329.5]
N17 (Lantau)	Nil	Nil	11.0	201.0	5.0	118.0	335.0
N13 (Sai Kung)	Nil	Nil	29.0	161.0	N/A	N/A	[190.0]
N09 (Sha Tin)	Nil	Nil	22.5	[224.5]	111.5	120.0	[478.5]
R26 (Shek Kong)	Nil	Nil	15.0	169.0	5.5	131.5	321.0
N05 (Sheung Shui)	Nil	Nil	18.0	122.0	14.5	104.5	259.0
R31 (Tai Po)	Nil	Nil	21.0	173.5	39.0	106.5	340.0
N06 (Tsuen Wan - Kwai Chung)	Nil	Nil	23.5	244.5	109.0	103.5	480.5
R21 (Tuen Mun)	Nil	Nil	[5.5]	95.5	8.0	87.0	[196.0]
N12 (Yuen Long)	Nil	Nil	6.5	133.0	7.0	86.5	233.0

Note : [ ] based on incomplete hourly data.

N/A data not available.

Times and heights of the maximum sea level and the maximum storm surge recorded at tide stations in Hong Kong during the passage of Helen :-

Station (see Fig. 1)	Maximum sea level above chart datum			Maximum storm surge above astronomical tide		
	Height (m)	Date	Time	Height (m)	Date	Time
Lok On Pai	2.62	11 Aug	9.38 a.m.	0.29	12 Aug	3.54 a.m.
Quarry Bay	2.59	12 Aug	10.20 a.m.	0.55	12 Aug	1.03 a.m.
Tai Po Kau	2.90*	12 Aug	7.15 a.m.	1.00*	12 Aug	6.28 a.m.
Tsim Bei Tsui	3.41	12 Aug	10.35 a.m.	0.77	12 Aug	10.03 a.m.
Waglan Island	2.61	12 Aug	9.51 a.m.	0.64	12 Aug	2.03 a.m.

\* Estimated from tidal records.

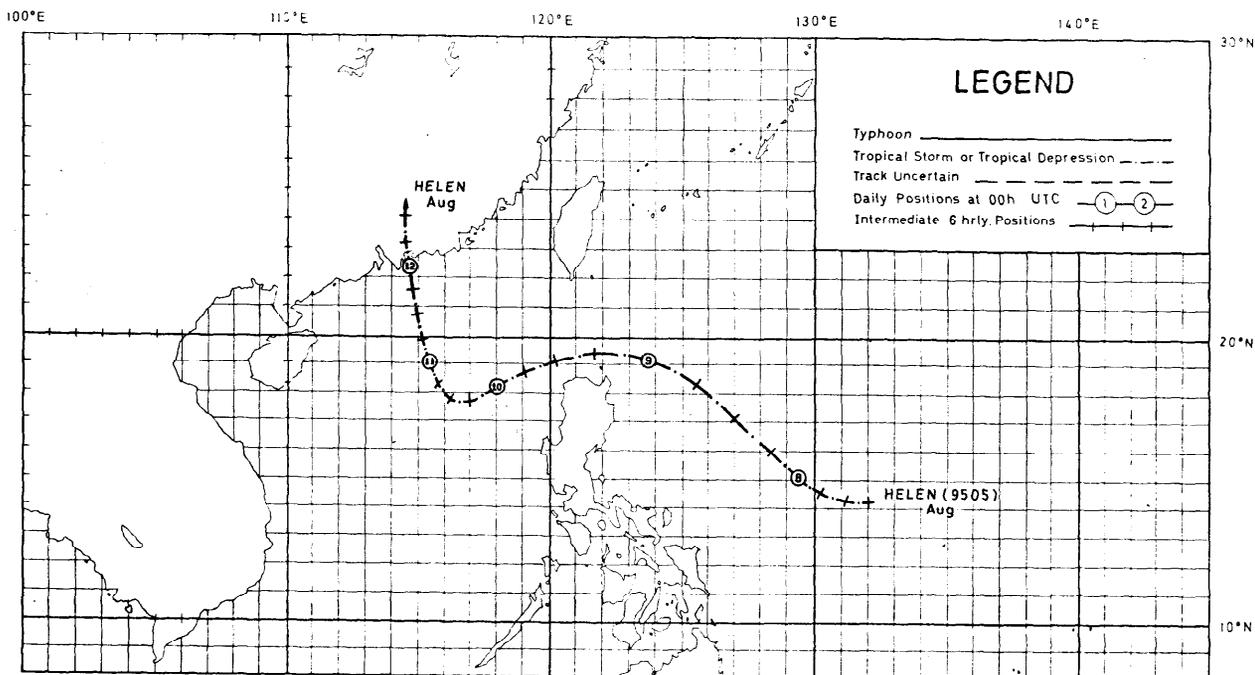


Figure 8. Track of Severe Tropical Storm Helen (9505) : 7 - 12 August 1995.

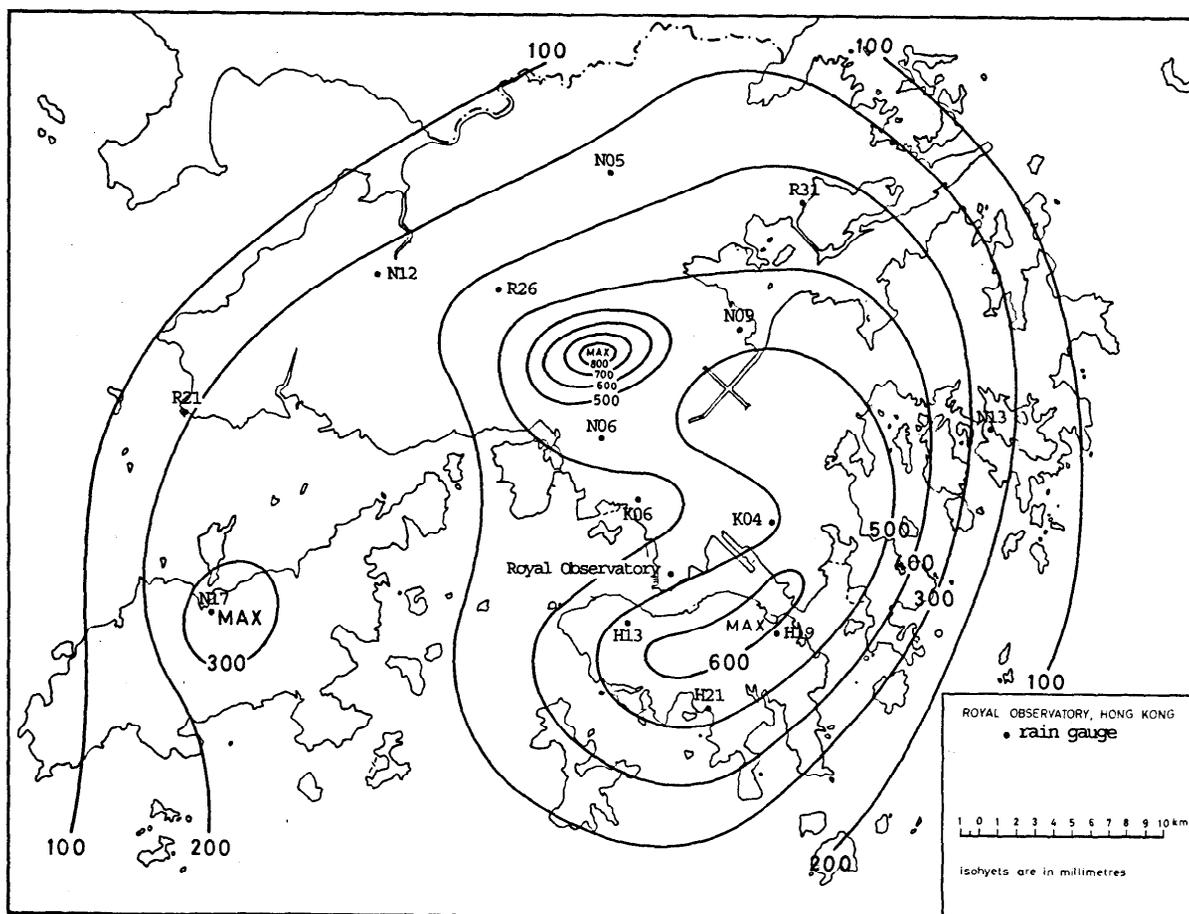


Figure 9. Rainfall distribution on 9 - 14 August 1995.

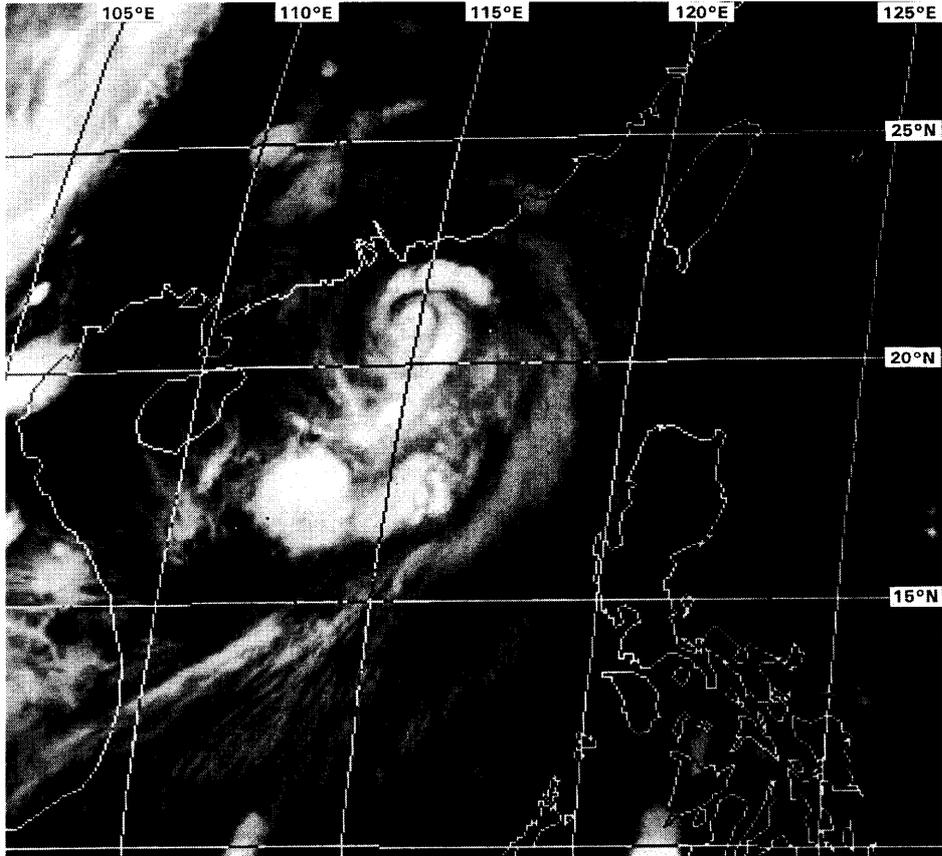


Figure 10. Infra-red imagery of Helen at around 11 p.m. on 11 August 1995 (originally captured by GMS of JMA).

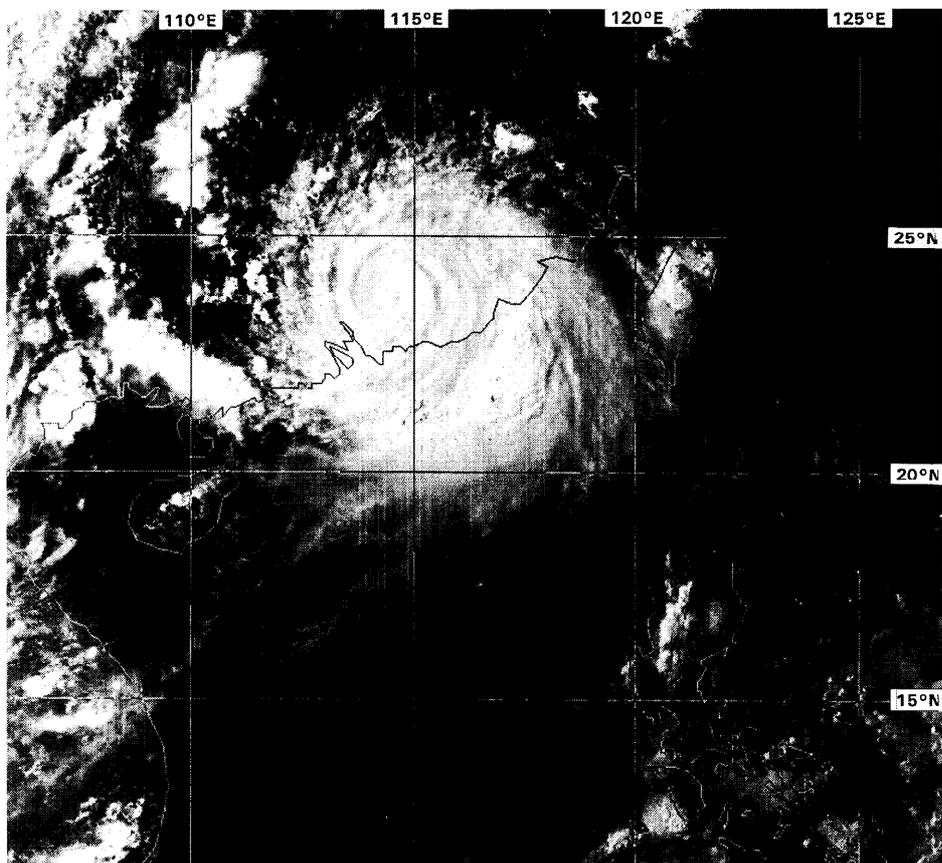


Figure 11. Visible imagery of Helen at around 5 p.m. on 12 August 1995 (originally captured by GMS of JMA).

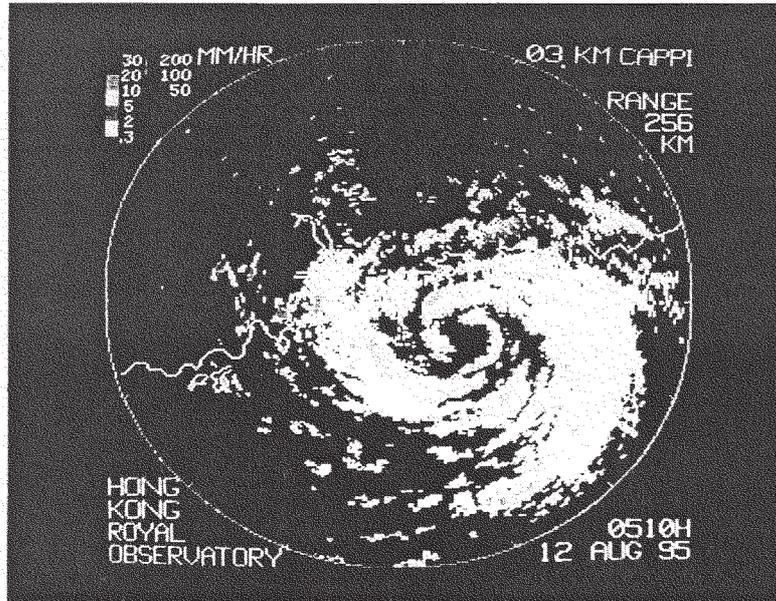


Figure 12. Radar display of the rain echoes of Helen at 5.10 a.m. on 12 August 1995.

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Figure 13. A landslip in Fei Tsui Road, Chai Wan (by courtesy of Ta Kung Pao).

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Figure 14. A landslide in Nam Long Shan, Aberdeen (by courtesy of Ta Kung Pao).

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Figure 15. Flooding in the northern New Territories (by courtesy of Ta Kung Pao).

**(c) Tropical Storm Irving (9506)****17 - 20 August 1995**

The track of Irving is shown in Figure 16

An area of low pressure over the South China Sea developed into a tropical depression named Irving about 120 km south of Xisha on 17 August. Moving northwards at 15 km/h, Irving intensified into a tropical storm the following morning. Shortly after weakening into a tropical depression, Irving made landfall over Leizhou Peninsula on the morning of 20 August. It then lost strength rapidly and dissipated.

In Hong Kong the Stand By Signal No. 1 was hoisted at 12.30 p.m. on 18 August when Irving was about 510 km to the south-southwest. The No. 1 signal was lowered at 11.45 p.m. on 19 August as Irving continued to move away from Hong Kong. Irving came closest to Hong Kong at around 8 a.m. on 19 August when it was about 400 km to the southwest. At the Royal Observatory Headquarters, the lowest hourly sea-level pressure of 1 007.4 hPa was recorded at 5 p.m. on 19 August.

Irving's circulation was rather compact and during its passage the local weather remained fine with moderate east to southeasterly winds, occasionally fresh offshore. Only trace amounts of rainfall were recorded in Hong Kong on days when tropical cyclone warning signal was hoisted for Irving. No significant damage was reported in the territory during the passage of Irving.

Information on wind and tide during the passage of Irving is given as follows :

Maximum gust peak speeds and maximum hourly mean winds with associated wind directions recorded at various stations during the hoisting of tropical cyclone warning signal for Irving :-

Station (see Fig. 1)	Maximum Gust		Date	Time	Maximum Hourly Wind		Date	Time		
	Direction	Speed (km/h)			Direction	Speed (km/h)				
Central	<b>ESE</b>	38	19	Aug	1529	<b>E</b>	22	19	Aug	1500
Cheung Chau	<b>ESE</b>	43	19	Aug	1744	<b>ESE</b>	31	19	Aug	1500
Cheung Sha Wan	<b>ENE</b>	40	19	Aug	1457	<b>ENE</b>	19	19	Aug	1500
H.K. Airport (SE)	<b>E</b>	40	19	Aug	2147	<b>E</b>	22	18	Aug	1500
King's Park	<b>E</b>	34	19	Aug	1324	<b>SE</b>	14	19	Aug	2100
Lau Fau Shan	<b>E</b>	38	19	Aug	1617	<b>E</b>	23	19	Aug	1800
Ping Chau	<b>E</b>	30	19	Aug	1519	<b>SE</b>	7	18	Aug	1800
						<b>E</b>	7	19	Aug	1000
Sai Kung	<b>E</b>	31	19	Aug	1436	<b>E</b>	20	19	Aug	1500
Sha Tin	<b>E</b>	34	19	Aug	1317	<b>E</b>	13	19	Aug	1500
Star Ferry	<b>E</b>	40	19	Aug	1435	<b>E</b>	25	19	Aug	1600
Ta Kwu Ling	-	38	19	Aug	1404	-	19	19	Aug	1400
						-	19	19	Aug	1500
Tai Mei Tuk	<b>E</b>	40	19	Aug	1542	<b>E</b>	25	19	Aug	1500
Tai Mo Shan	<b>ENE</b>	58	19	Aug	0023	<b>E</b>	51	19	Aug	0100
	<b>ENE</b>	58	19	Aug	2056					
Tap Mun	<b>ESE</b>	31	19	Aug	1923	<b>SE</b>	16	18	Aug	1700
Tseung Kwan O	<b>ENE</b>	36	19	Aug	2121	<b>E</b>	16	19	Aug	1500
Tsing Yi	<b>ESE</b>	51	19	Aug	1603	<b>ESE</b>	27	19	Aug	2100
Tuen Mun	<b>S</b>	38	19	Aug	1633	<b>SW</b>	19	18	Aug	1300
Waglan Island	<b>E</b>	38	19	Aug	1504	<b>E</b>	31	19	Aug	1500
Wan Chai	<b>ENE</b>	47	19	Aug	2052	<b>ENE</b>	30	19	Aug	1600

Stations with no record :

Green Island

Sha Lo Wan

Tai Po Kau

Tate's Cairn

Wong Chuk Hang

Times and heights of the maximum sea level and the maximum storm surge recorded at tide stations in Hong Kong during the passage of Irving :-

Station (see Fig. 1)	Maximum sea level above chart datum			Maximum storm surge above astronomical tide		
	Height (m)	Date	Time	Height (m)	Date	Time
Tai Po Kau	2.02	20 Aug	5.55 a.m.	0.21	19 Aug	0.35 a.m.
Waglan Island	1.98	20 Aug	5.01 a.m.	0.17	20 Aug	6.48 a.m.

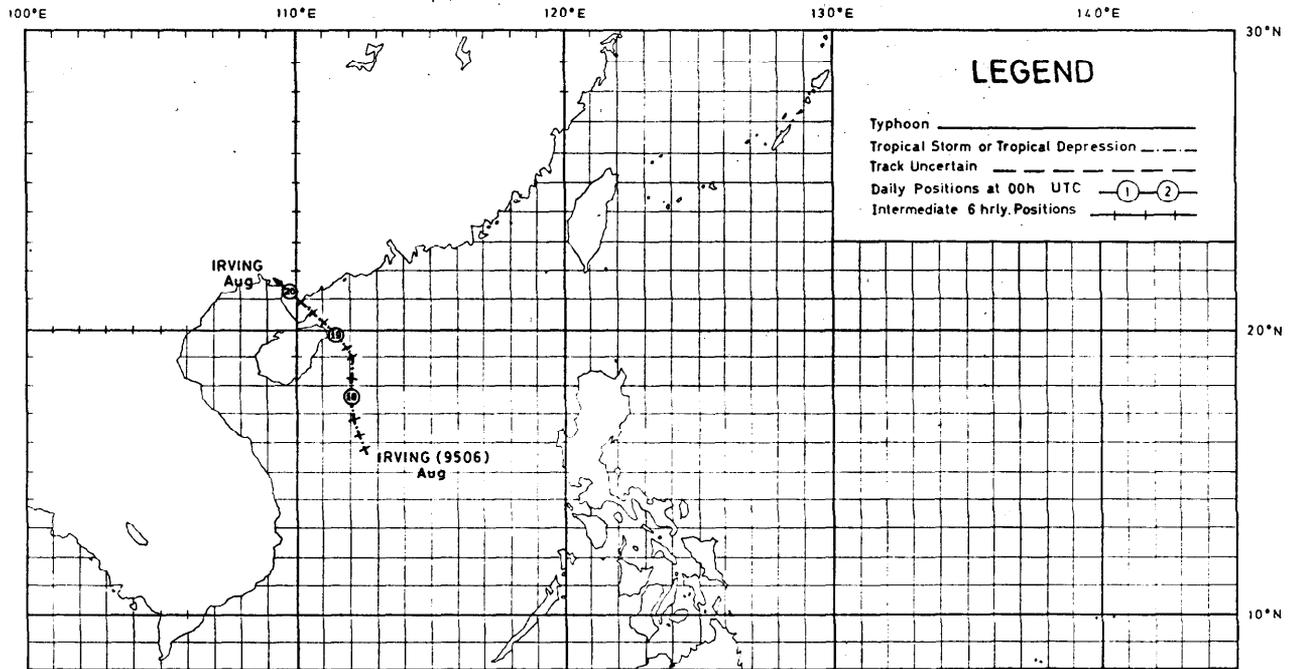


Figure 16. Track of Tropical Storm Irving (9506) : 17 - 20 August 1995.

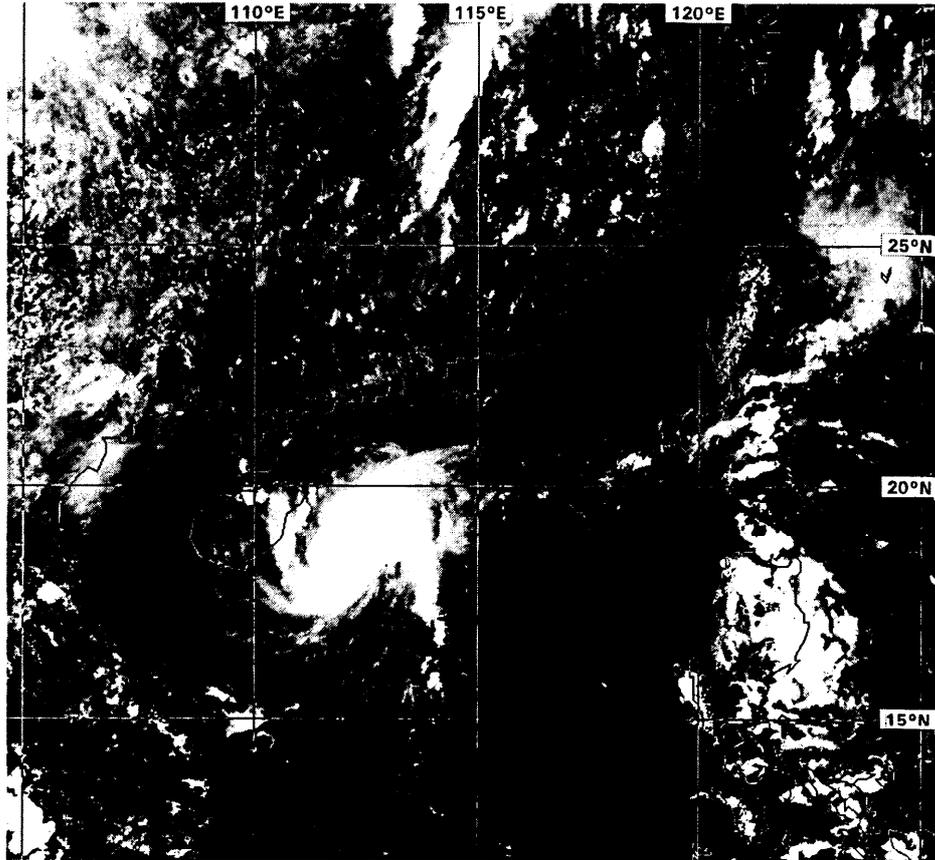


Figure 17. Visible imagery of Irving at around 2 p.m. on 18 August 1995 (originally captured by GMS of JMA).

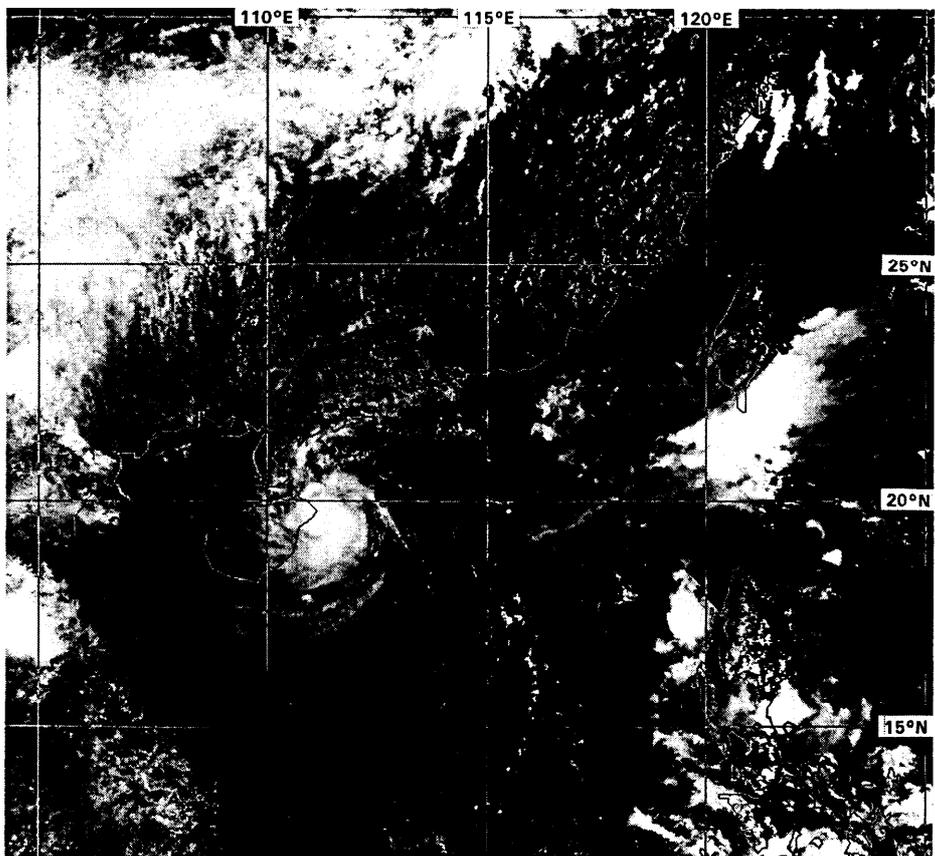


Figure 18. Visible imagery of Irving at around 11 a.m. on 19 August 1995 (originally captured by GMS of JMA).

**(d) Severe Tropical Storm Lois (9509)****26 - 30 August 1995**

The track of Lois is shown in Figure 19

An area of disturbance over the South China Sea developed into Tropical Depression Lois about 290 km east-northeast of Xisha on 26 August. Moving westwards at 10 km/h, Lois intensified and became a severe tropical storm the next day. Lois wreaked havoc on Hainan Island where it made landfall on 28 August. About 17 people were killed and nine injured. Many fishing vessels capsized in high winds. Leaving Hainan, Lois crossed Beibu Wan to land over northern Vietnam on 30 August and soon dissipated.

As Lois intensified, the Stand By Signal No. 1 was hoisted at 1.15 p.m. on 27 August. Although Lois was never closer than about 530 km of Hong Kong as it tracked westwards across the South China Sea, its extensive circulation caused fresh gusty winds to blow in the harbour, and stronger winds offshore as well as on hilltops. There were also occasional squally showers. As Lois made landfall over Hainan, the No. 1 signal was lowered at 9.35 a.m. on 28 August. Lois was closest to Hong Kong at around 2 p.m. on 26 August. At the Royal Observatory Headquarters, the lowest hourly sea-level pressure of 1 002.6 hPa was recorded at 4 p.m. and 5 p.m. on 26 August.

Apart from a fallen canopy suspected to be blown off by strong gusts in Cheung Sha Wan, no significant damage was reported during the passage of Lois.

The rainfall distribution associated with Lois is shown in Figure 20. Information on wind, rainfall and tide during the passage of Lois is given as follows :

Maximum gust peak speeds and maximum hourly mean winds with associated wind directions recorded at various stations during the hoisting of tropical cyclone warning signal for Lois :-

<u>Station</u> (see Fig. 1)	<u>Maximum Gust</u>			<u>Maximum Hourly Wind</u>			<u>Date</u>	<u>Time</u>
	<u>Direction</u>	<u>Speed (km/h)</u>	<u>Date</u>	<u>Time</u>	<u>Direction</u>	<u>Speed (km/h)</u>		
Central	<b>E</b>	62	28 Aug	0207	<b>E</b>	31	28 Aug	0300
Cheung Chau	<b>ESE</b>	87	27 Aug	1848	<b>ESE</b>	54	28 Aug	0300
Cheung Sha Wan	<b>ESE</b>	58	27 Aug	1839	<b>ENE</b>	20	27 Aug	2300
H.K. Airport (SE)	<b>E</b>	79	27 Aug	1535	<b>E</b>	36	27 Aug	1600
					<b>E</b>	36	27 Aug	2400
					<b>E</b>	36	28 Aug	0100
					<b>E</b>	36	28 Aug	0200
					<b>E</b>	36	28 Aug	0400
King's Park	<b>ESE</b>	62	27 Aug	1835	<b>ESE</b>	23	28 Aug	0300
Lau Fau Shan	<b>E</b>	58	28 Aug	0129	<b>E</b>	30	28 Aug	0300
Ping Chau	<b>ENE</b>	56	27 Aug	2308	<b>E</b>	23	27 Aug	2400
Sai Kung	<b>S</b>	68	27 Aug	1506	<b>SE</b>	31	27 Aug	1600
					<b>E</b>	31	27 Aug	2400
Sha Tin	<b>NE</b>	52	28 Aug	0102	<b>ENE</b>	16	27 Aug	2400
					<b>ENE</b>	16	28 Aug	0100
Star Ferry	<b>E</b>	77	28 Aug	0500	<b>E</b>	34	28 Aug	0100
Ta Kwu Ling	-	56	28 Aug	0308	-	25	28 Aug	0400
Tai Mei Tuk	<b>E</b>	75	27 Aug	1321	<b>E</b>	49	28 Aug	0100
Tai Mo Shan	<b>ENE</b>	118	28 Aug	0038	<b>ENE</b>	83	28 Aug	0200
Tap Mun	<b>ESE</b>	75	27 Aug	1545	<b>ESE</b>	36	27 Aug	1600
Tseung Kwan O	<b>SSE</b>	65	27 Aug	1535	<b>E</b>	20	28 Aug	0200
Tsing Yi	<b>ESE</b>	94	27 Aug	1845	<b>ESE</b>	43	28 Aug	0400
Tuen Mun	<b>S</b>	62	27 Aug	1612	<b>S</b>	20	27 Aug	1400
Waglan Island	<b>E</b>	92	27 Aug	1819	<b>E</b>	51	27 Aug	2400
Wan Chai	<b>E</b>	92	27 Aug	1836	<b>E</b>	58	27 Aug	1900

Stations with no record :  
 Green Island  
 Sha Lo Wan  
 Tai Po Kau  
 Tate's Cairn  
 Wong Chuk Hang

Daily rainfall amounts in millimetres recorded at the Royal Observatory and other stations during the passage of Lois :-

<u>Station</u> (see Fig. 20)	<u>26 Aug</u>	<u>27 Aug</u>	<u>28 Aug</u>	<u>29 Aug</u>	<u>Total</u>
Royal Observatory	57.7	41.6	9.9	8.3	117.5
H19 (HK Island (east))	30.0	44.0	8.0	5.5	87.5
H13 (HK Island (west))	33.0	53.5	15.0	4.5	106.0
H21 (HK Island (south))	24.5	65.0	14.0	2.0	105.5
K04 (Kowloon (east))	38.0	64.5	19.5	9.0	131.0
K06 (Kowloon (west))	26.0	42.0	10.5	6.5	85.0
N17 (Lantau)	20.0	42.5	23.5	15.0	101.0
N13 (Sai Kung)	11.0	44.0	16.5	23.5	95.0
N09 (Sha Tin)	18.0	62.0	20.0	39.5	139.5
R26 (Shek Kong)	6.5	48.0	9.5	[12.5]	[76.5]
N05 (Sheung Shui)	9.5	59.0	42.5	21.0	132.0
R31 (Tai Po)	2.5	[38.0]	24.0	[Nil]	[64.5]
N06 (Tsuen Wan - Kwai Chung)	18.5	56.0	24.0	5.0	103.5
R21 (Tuen Mun)	8.5	35.0	11.0	[10.5]	[65.0]
N12 (Yuen Long)	4.5	47.5	19.5	10.5	82.0

Note : [ ] based on incomplete hourly data.

Times and heights of the maximum sea level and the maximum storm surge recorded at tide stations in Hong Kong during the passage of Lois :-

Station (see Fig. 1)	Maximum sea level above chart datum			Maximum storm surge above astronomical tide		
	Height (m)	Date	Time	Height (m)	Date	Time
Quarry Bay	2.34	27 Aug	8.29 a.m.	0.35	27 Aug	7.41 a.m.
Waglan Island	2.42	27 Aug	8.45 a.m.	0.34	27 Aug	7.33 a.m.

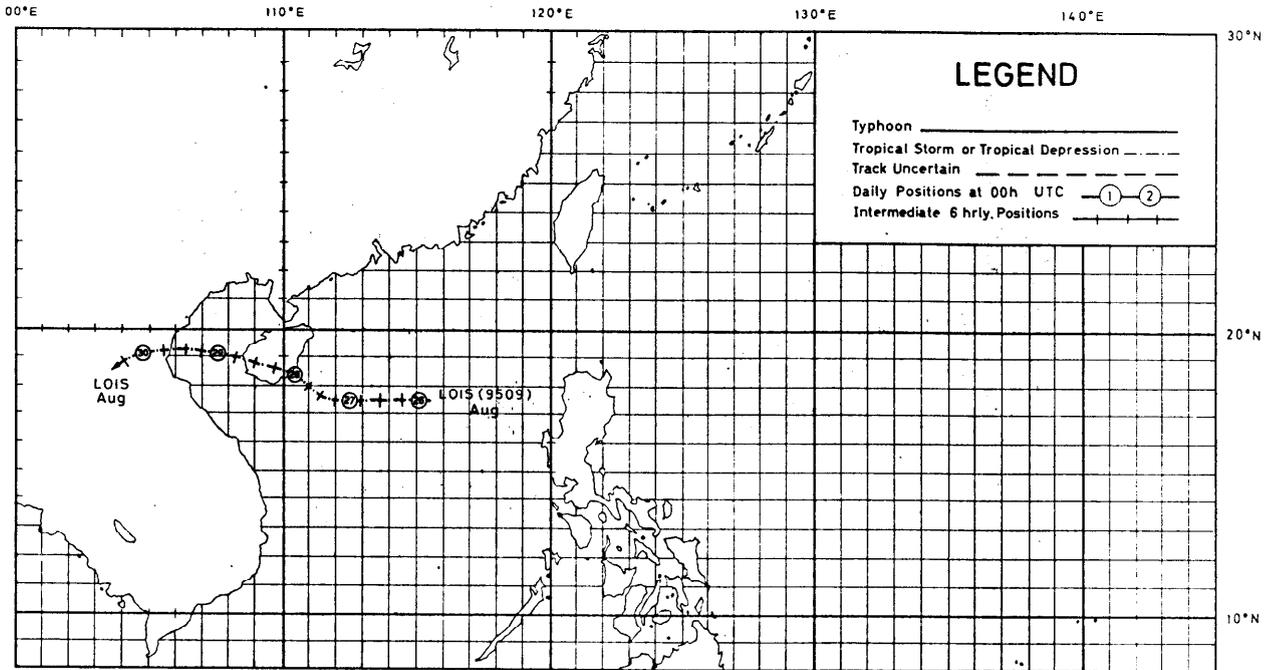


Figure 19. Track of Severe Tropical Storm Lois (9509) : 26 - 30 August 1995.

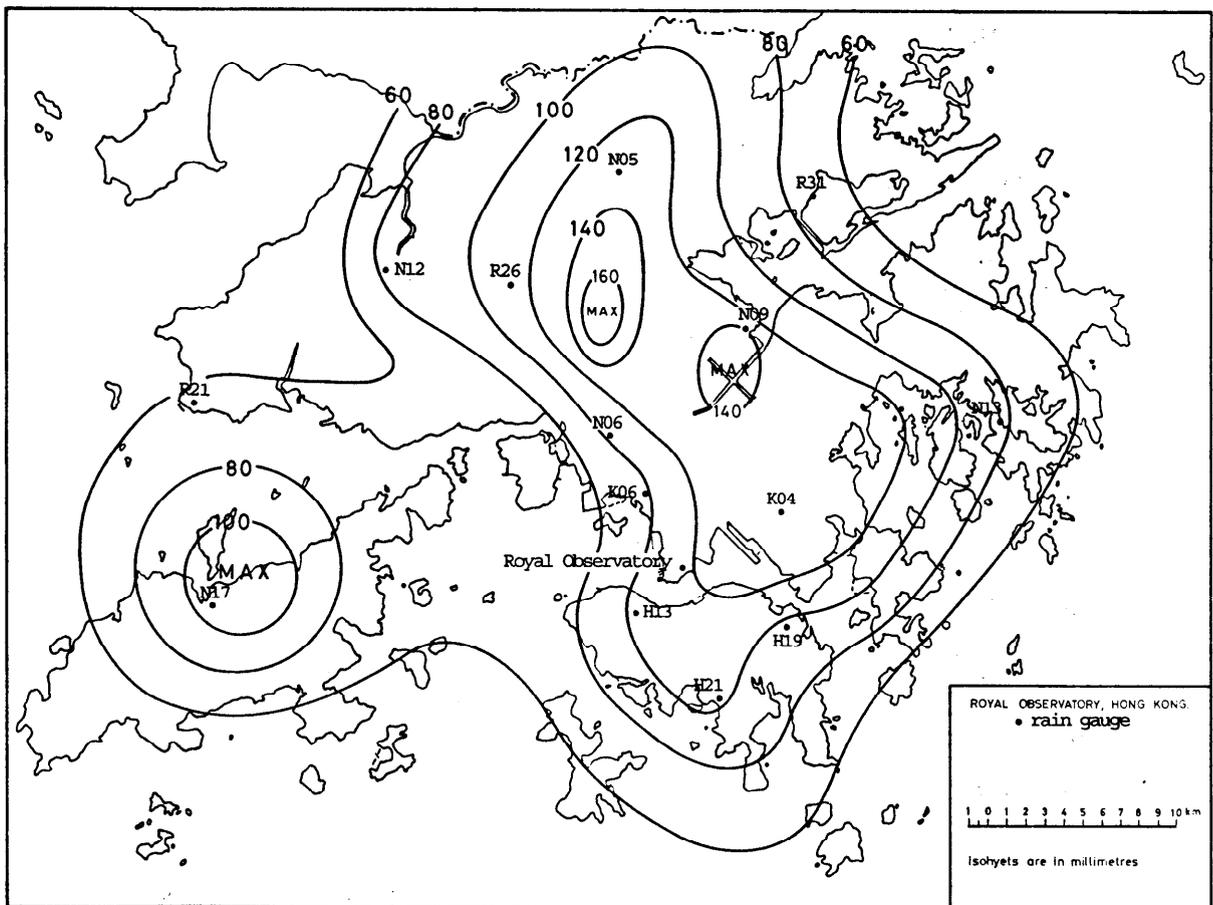


Figure 20. Rainfall distribution on 26 - 29 August 1995.

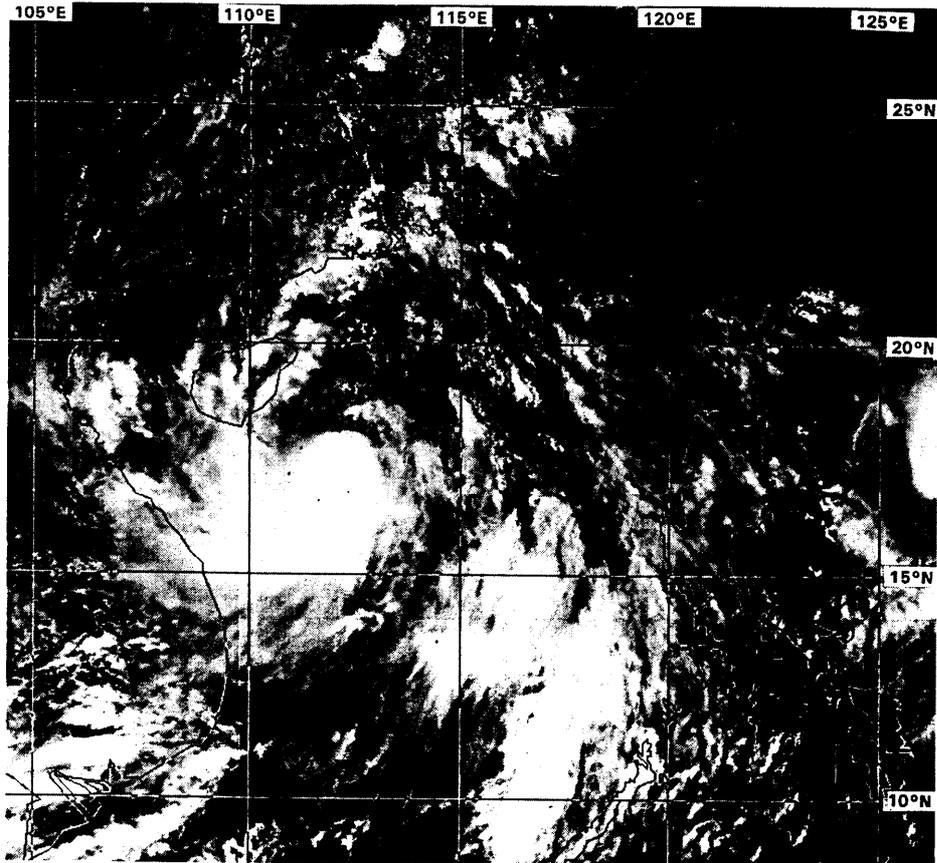


Figure 21. Visible imagery of Lois at around 2 p.m. on 27 August 1995 (originally captured by GMS of JMA).

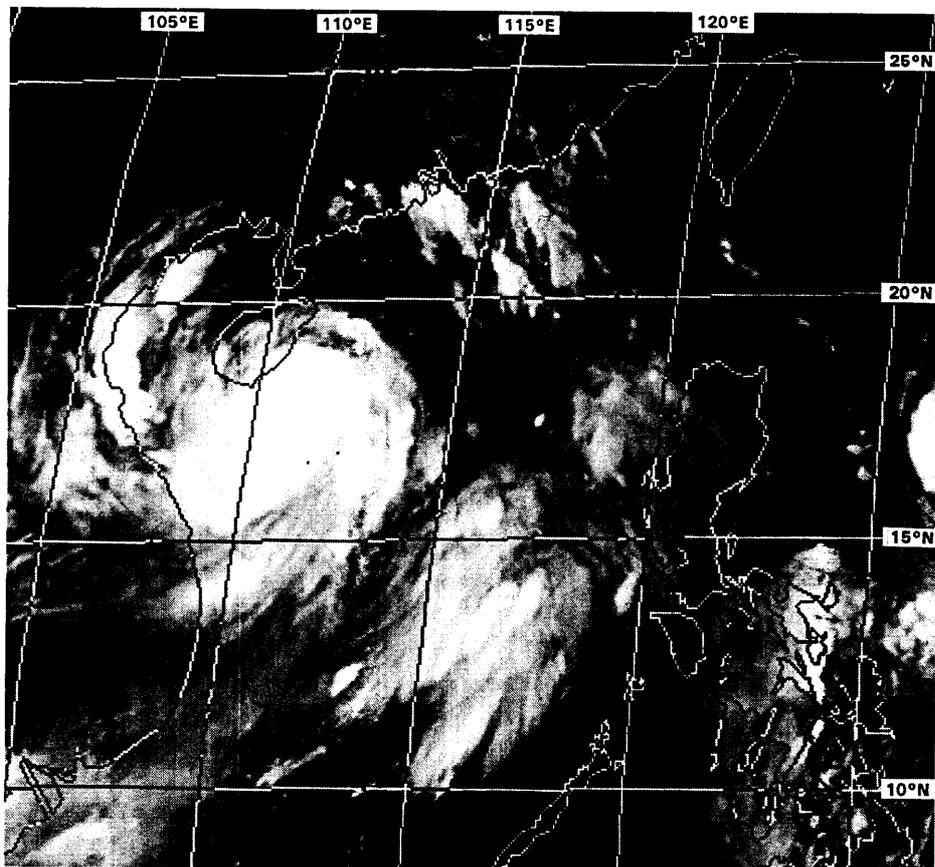


Figure 22. Infra-red imagery of Lois at around 2 a.m. on 28 August 1995 (originally captured by GMS of JMA).

**(e) Typhoon Kent (9508)****25 August - 1 September 1995**

The track of Kent is shown in Figure 23

Over the western North Pacific, Kent formed as a tropical depression about 990 km east of Manila on 25 August. Moving northwestwards towards the Luzon Strait, Kent intensified progressively and attained typhoon strength on 29 August. Kent entered the South China Sea on 30 August and headed west-northwestwards towards the coast of Guangdong where it made landfall about 110 km east-northeast of Hong Kong. Over land, Kent weakened rapidly and dissipated on 1 September.

Kent brought heavy rain to the northern Philippines, causing flash floods and triggering mudflows from Mount Pinatubo. Five people were killed. Kent also affected southern Taiwan where one person was found dead and another missing. Serious damage was inflicted by Kent on Guangdong. At least 50 people were killed, more than 40 000 houses collapsed or were damaged, and 280 000 hectares of farmland inundated. The total economic loss was estimated to be 3.2 billion RMB.

In Hong Kong the Stand By Signal No. 1 was hoisted at noon on 30 August. Moving with a speed in excess of 25 km/h towards the central part of the Guangdong coast and packing maximum sustained winds of 140 km/h or more near its centre, Kent posed a serious threat to the territory. The public was advised that higher signals would be necessary the next day and to take all precautions.

With Kent already due east of Hong Kong and moving steadily closer, the Strong Wind Signal No.3 was hoisted at 4.00 a.m. on 31 August to give timely warning that strong winds and deterioration in the local weather might set in abruptly. At the same time, the public was informed that the No.8 Gale or Storm Signal might have to be hoisted later in the day.

The morning of 31 August was mainly fine and deceptively calm, winds being from the northwest and the harbour areas thus sheltered. Meanwhile Kent had come still closer with little change in speed or intensity. With the onset of gales expected in the late afternoon and so as to allow employees with long and difficult journeys home to be released from work accordingly, announcements were made as early as 11 a.m. that the No.8 Signal would be hoisted shortly.

As winds strengthened and the rainbands of Kent began to affect the territory, the No.8 NORTHWEST Gale or Storm Signal was hoisted at 1 p.m. when Kent was about 150 km to the east-northeast. Shortly after 4 p.m., winds started to turn southwesterly. Gales affected many places in Hong Kong with winds of around 75 km/h recorded at Lau Fau Shan and gusts of around 80 km/h at Star Ferry. The No.8 NORTHWEST signal was replaced by the No.8 SOUTHWEST Gale or Storm Signal at 4.45 p.m.

Kent weakened rapidly after making landfall over the coast of Guangdong and the No.8 SOUTHWEST signal was replaced by the Strong Wind Signal No.3 at 9.00 p.m. in the evening. As winds in Hong Kong subsided further, all signals were lowered at 0.15 a.m. on 1 September. Kent came closest to Hong Kong at around 5 p.m. on 31 August when it was about 80 km to the north-northeast. At the Royal Observatory Headquarters, the lowest hourly sea-level pressure of 991.3 hPa was recorded at 4 p.m. on 31 August.

Kent's winds and heavy downpours uprooted trees in many places and caused flooding as well as landslips in several areas. The most serious flooding were reported in Tuen Mun, Mid-levels and Sheung Shui. In Kwun Tong, a boulder weighing half a tonne tumbled down a hill and crashed onto Cha Kwo Ling Road. The high winds also caused a number of road accidents in which a total of five people was injured. Besides the land traffic, sea and air transports were also severely disrupted during the passage of Kent.

Press reports suggest that the two-hour advance warning given by the Royal Observatory on the hoisting of the No.8 Signal was generally well received by the public, as was the raising of this signal to mitigate the damage brought by a typhoon as intense, wreaking as much havoc over Guangdong and coming as close to Hong Kong as Kent.

The rainfall distribution associated with Kent is shown in Figure 24. Information on wind, rainfall and tide during the passage of Kent is given as follows :

Maximum gust peak speeds and maximum hourly mean winds with associated wind directions recorded at various stations during the hoisting of tropical cyclone warning signals for Kent :-

<u>Station</u> (see Fig. 1)	<u>Maximum Gust</u>			<u>Maximum Hourly Wind</u>			<u>Date</u>	<u>Time</u>
	<u>Direction</u>	<u>Speed (km/h)</u>	<u>Date</u>	<u>Time</u>	<u>Direction</u>	<u>Speed (km/h)</u>		
Central	NW	51	31 Aug	1213	NW	23	31 Aug	1100
Cheung Chau	WNW	96	31 Aug	1427	WNW	23	31 Aug	1200
Cheung Sha Wan	SW	70	31 Aug	1745	SSW	31	31 Aug	1600
H.K. Airport (SE)	SW	85	31 Aug	1745	W	51	31 Aug	1900
King's Park	W	72	31 Aug	1609	W	23	31 Aug	1700
Lau Fau Shan	W	115	31 Aug	1624	WSW	77	31 Aug	1600
Ping Chau	WNW	118	31 Aug	1512	W	65	31 Aug	1800
Sai Kung	W	81	31 Aug	1432	WSW	36	31 Aug	1700
Sha Tin	SSW	65	31 Aug	1716	SSW	30	31 Aug	1800
Star Ferry	W	85	31 Aug	1633	W	56	31 Aug	1600
					W	56	31 Aug	1700
Ta Kwu Ling	-	90	31 Aug	1748	-	34	31 Aug	1800
Tai Mei Tuk	WSW	118	31 Aug	1714	WSW	70	31 Aug	1800
Tai Mo Shan	SW	149	31 Aug	1656	SW	104	31 Aug	1700
Tap Mun	W	126	31 Aug	1506	W	62	31 Aug	1500
Tate's Cairn	W	131	31 Aug	1454	WSW	72	31 Aug	1700
Tseung Kwan O	SSW	70	31 Aug	1723	SSW	23	31 Aug	1800
Tsing Yi	WNW	115	31 Aug	1710	SSE	43	31 Aug	2100
Tuen Mun	NW	85	31 Aug	1633	NW	27	31 Aug	1600
Waglan Island	WNW	101	31 Aug	1436	W	72	31 Aug	1600
Wan Chai	W	126	31 Aug	1528	WNW	79	31 Aug	1500

Stations with no record :

Green Island  
Sha Lo Wan  
Tai Po Kau  
Wong Chuk Hang

Daily rainfall amounts in millimetres recorded at the Royal Observatory and other stations on days when tropical cyclone warning signals were hoisted for Kent :-

<u>Station</u> (see Fig. 24)	<u>30 Aug</u>	<u>31 Aug</u>	<u>1 Sep</u>	<u>Total</u>
Royal Observatory	Nil	117.9	17.1	135.0
H19 (HK Island (east))	Nil	154.5	29.5	184.0
H13 (HK Island (west))	Nil	138.5	27.0	165.5
H21 (HK Island (south))	Nil	137.0	12.0	149.0
K04 (Kowloon (east))	Nil	135.0	22.0	157.0
K06 (Kowloon (west))	Nil	162.5	16.0	178.5
N17 (Lantau)	Nil	147.5	25.5	173.0
N13 (Sai Kung)	Nil	130.0	10.5	140.5
N09 (Sha Tin)	Nil	159.0	53.5	212.5
R26 (Shek Kong)	Nil	[110.0]	34.5	[144.5]
N05 (Sheung Shui)	Nil	110.0	28.0	138.0
R31 (Tai Po)	Nil	[17.5]	[19.5]	[37.0]
N06 (Tsuen Wan - Kwai Chung)	Nil	187.5	31.5	219.0

<u>Station</u> (see Fig. 24)	<u>30 Aug</u>	<u>31 Aug</u>	<u>1 Sep</u>	<u>Total</u>
R21 (Tuen Mun)	Nil	80.5	23.5	104.0
N12 (Yuen Long)	Nil	101.0	17.5	118.5

Note : [ ] based on incomplete hourly data.

Times and heights of the maximum sea level and the maximum storm surge recorded at tide stations in Hong Kong during the passage of Kent :-

Station (see Fig. 1)	Maximum sea level above chart datum			Maximum storm surge above astronomical tide		
	Height (m)	Date	Time	Height (m)	Date	Time
Quarry Bay	2.20	31 Aug	10.59 p.m.	0.48	31 Aug	4.50 p.m.
Waglan Island	2.28	31 Aug	11.18 p.m.	0.51	31 Aug	4.32 p.m.

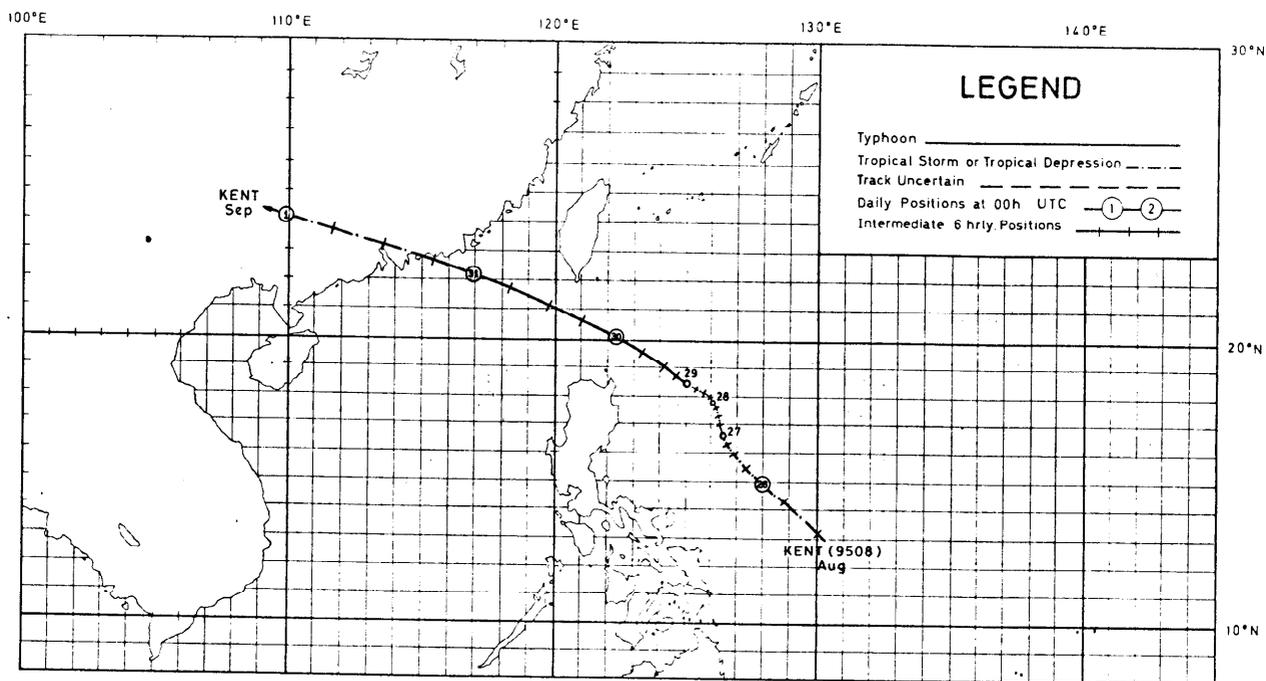


Figure 23. Track of Typhoon Kent (9508) : 25 August - 1 September 1995.

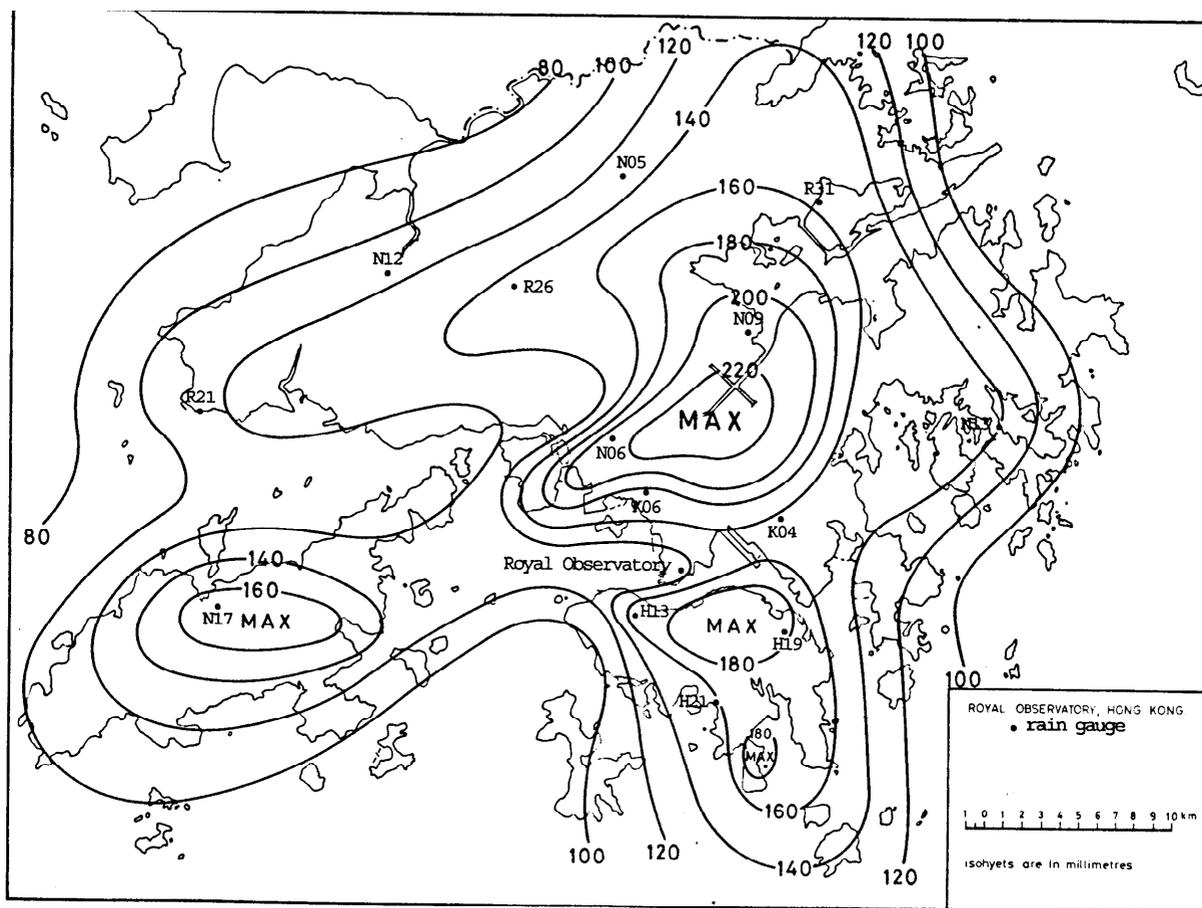


Figure 24. Rainfall distribution on 30 August - 1 September 1995.

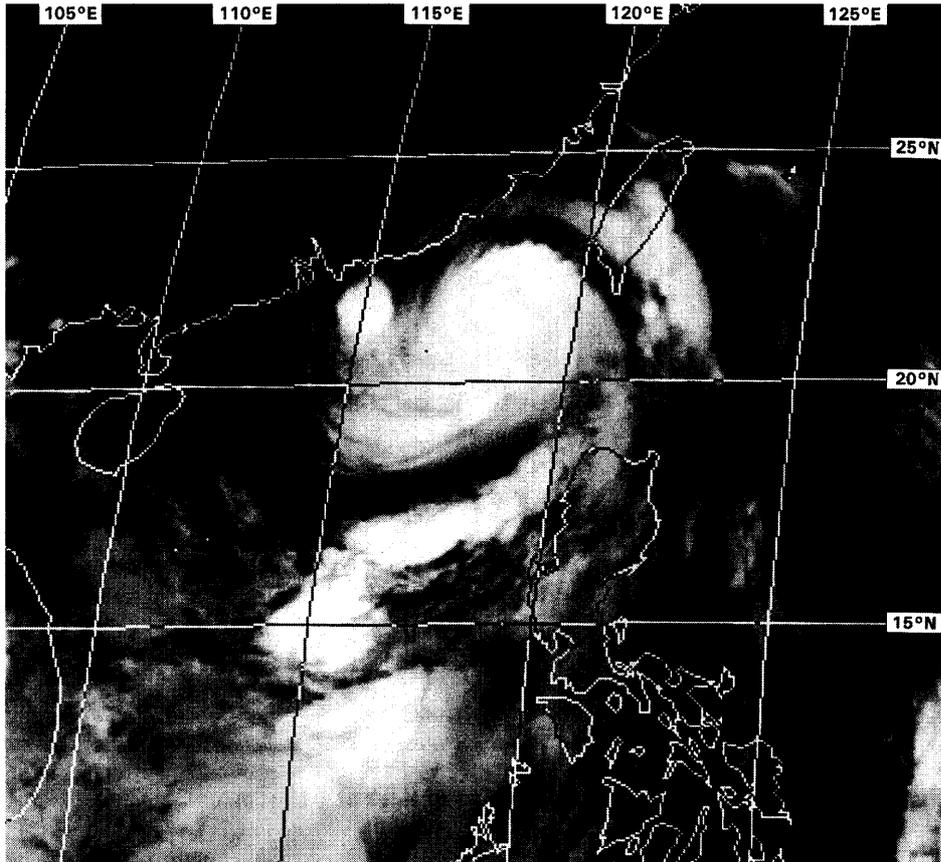


Figure 25. Infra-red imagery of Kent at around 2 a.m. on 31 August 1995 (originally captured by GMS of JMA).

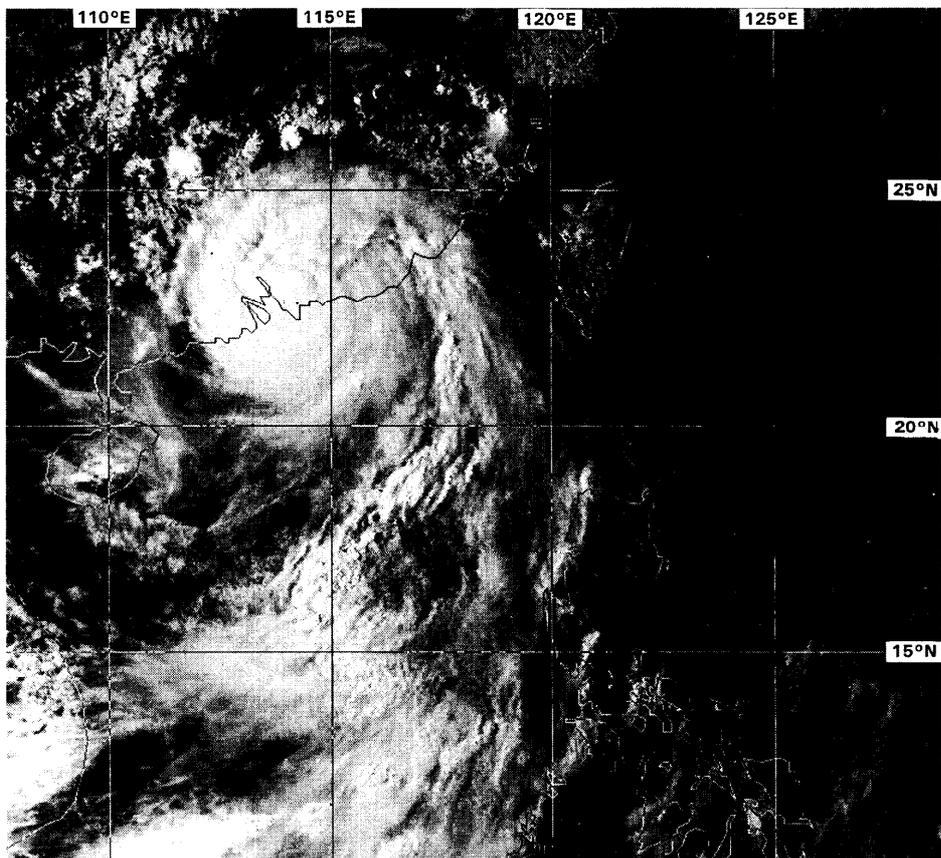


Figure 26. Visible imagery of Kent at around 5 p.m. on 31 August 1995 (originally captured by GMS of JMA).

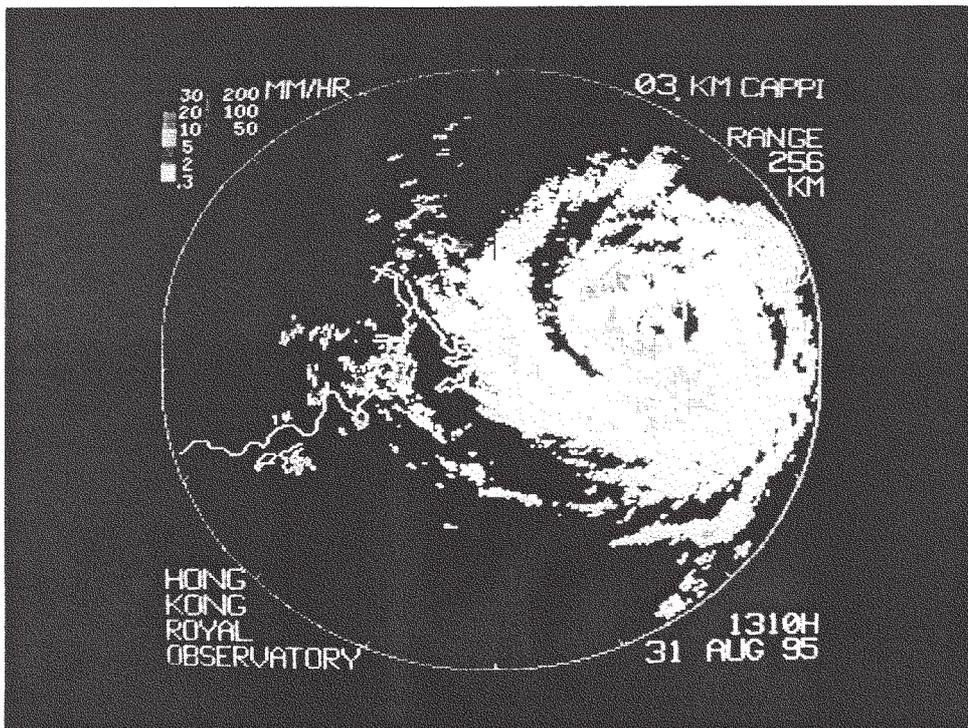


Figure 27. Radar display of the rain echoes of Kent at 1.10 p.m. on 31 August 1995.

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Figure 28. A collapsed advertisement signboard in Mong Kok (by courtesy of Ta Kung Pao).

**(f) Tropical Storm Nina (9511)****2 - 7 September 1995**

The track of Nina is shown in Figure 29

Nina formed as a tropical depression about 970 km east-southeast of Manila on 2 September. It made landfall over the Philippines two days later where five people were killed as their boat capsized. Heavy rain associated with Nina triggered off mudflows from Mount Pinatubo which buried some 700 houses. Nina entered the South China Sea on the afternoon of 4 September, tracking westwards at first but turning northwestwards the next day as it intensified into a tropical storm. Moving steadily over water, Nina landed over Leizhou Peninsula on 7 September and dissipated over land that evening. No significant damage was reported in China in connection with the passage of Nina.

In Hong Kong, the Stand By Signal No. 1 was hoisted at 9.45 a.m. on 6 September when Nina was due south. Local winds were intermittently strong offshore and on high ground on 6 and 7 September. With the rain area confined mainly to its south, Nina brought only a few squally showers to the territory. Nina was closest to Hong Kong at around 5 a.m. on 7 September when it was about 380 km to the southwest. The No. 1 signal was lowered at 10.15 a.m. on 7 September as Nina made landfall over Leizhou Peninsula. At the Royal Observatory Headquarters, the lowest hourly sea-level pressure of 1 003.4 hPa was recorded at 4 a.m., 5 a.m. and 6 a.m. on 6 September.

Locally no significant tropical cyclone damage was reported during the passage of Nina.

The rainfall distribution associated with Nina is shown in Figure 30. Information on wind, rainfall and tide during the passage of Nina is given as follows :

Maximum gust peak speeds and maximum hourly mean winds with associated wind directions recorded at various stations during the hoisting of tropical cyclone warning signal for Nina :-

<u>Station</u> (see Fig. 1)	<u>Maximum Gust</u>			<u>Maximum Hourly Wind</u>				
	<u>Direction</u>	<u>Speed (km/h)</u>	<u>Date</u>	<u>Time</u>	<u>Direction</u>	<u>Speed (km/h)</u>	<u>Date</u>	<u>Time</u>
Central	E	51	6 Sep	1806	E	25	6 Sep	1700
Cheung Chau	E	79	6 Sep	1501	ESE	49	7 Sep	0600
Cheung Sha Wan	ENE	58	6 Sep	1443	ENE	20	6 Sep	1500
Green Island	E	68	6 Sep	1449	E	43	6 Sep	1500
	ENE	68	6 Sep	1523				
H.K. Airport (SE)	E	67	6 Sep	1536	E	34	6 Sep	1900
King's Park	SE	45	6 Sep	1438	ESE	16	6 Sep	1900
	SE	45	6 Sep	1540				
Ping Chau	E	56	6 Sep	1508	E	23	6 Sep	1600
Sai Kung	E	68	6 Sep	1531	E	30	6 Sep	1400
Sha Tin	E	47	6 Sep	1539	E	14	6 Sep	1600
					SE	14	6 Sep	2100
					SSE	14	7 Sep	0800
Star Ferry	ESE	54	6 Sep	1734	ESE	31	7 Sep	0700
Ta Kwu Ling	-	54	6 Sep	1451	-	19	6 Sep	1400
Tai Mei Tuk	NE	58	6 Sep	1618	E	38	6 Sep	1300
	E	58	6 Sep	1721				
Tai Mo Shan	ENE	90	6 Sep	1835	ENE	65	6 Sep	1700
Tap Mun	E	56	6 Sep	1554	SE	31	7 Sep	0300
Tate's Cairn	ESE	83	6 Sep	1536	ESE	43	6 Sep	1600
Tseung Kwan O	NE	49	6 Sep	1707	E	16	6 Sep	1200
					E	16	6 Sep	1400
					SSE	16	7 Sep	0400
Tsing Yi	ESE	68	6 Sep	1940	SE	38	6 Sep	2100
Tuen Mun	-	52	7 Sep	0518	-	19	7 Sep	0100
Waglan Island	SE	59	6 Sep	1731	ESE	45	7 Sep	0600
Wan Chai	ESE	75	6 Sep	1729	ESE	43	6 Sep	1900

Stations with no record :  
 Lau Fau Shan  
 Sha Lo Wan  
 Tai Po Kau  
 Wong Chuk Hang

Daily rainfall amounts in millimetres recorded at the Royal Observatory and other stations on days when tropical cyclone warning signal was hoisted for Nina :-

<u>Station</u> (see Fig. 30)	<u>6 Sep</u>	<u>7 Sep</u>	<u>Total</u>
Royal Observatory	16.2	1.9	18.1
H19 (HK Island (east))	10.0	N/A	[10.0]
H13 (HK Island (west))	16.5	[Nil]	[16.5]
H21 (HK Island (south))	22.0	[Nil]	[22.0]
K04 (Kowloon (east))	18.0	[1.0]	[19.0]
K06 (Kowloon (west))	16.5	[Nil]	[16.5]
N17 (Lantau)	7.5	26.5	34.0
N13 (Sai Kung)	25.0	[0.5]	[25.5]
N09 (Sha Tin)	15.5	[13.0]	[28.5]
R26 (Shek Kong)	14.5	Nil	14.5
N05 (Sheung Shui)	26.0	[8.5]	[34.5]
R31 (Tai Po)	38.0	3.0	41.0
N06 (Tsuen Wan - Kwai Chung)	18.5	[1.0]	[19.5]
R21 (Tuen Mun)	10.5	29.5	40.0
N12 (Yuen Long)	12.0	[2.5]	[14.5]

Note : [ ] based on incomplete hourly data.  
 N/A data not available.

Times and heights of the maximum sea level and the maximum storm surge recorded at tide stations in Hong Kong during the passage of Nina :-

Station (see Fig. 1)	Maximum sea level above chart datum			Maximum storm surge above astronomical tide		
	Height (m)	Date	Time	Height (m)	Date	Time
Quarry Bay	2.31	7 Sep	7.03 a.m.	0.20	7 Sep	4.36 a.m.
Tai Po Kau	2.40	7 Sep	5.54 a.m.	0.38	6 Sep	3.09 a.m.

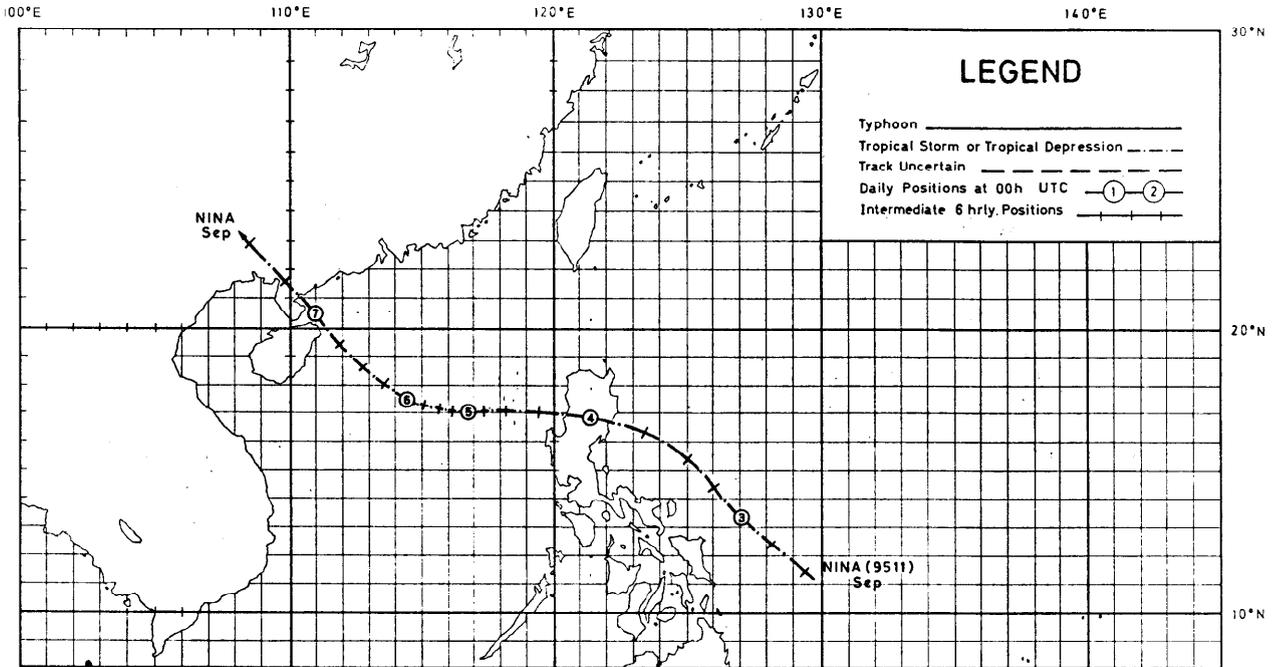


Figure 29. Track of Tropical Storm Nina (9511) : 2 - 7 September 1995.

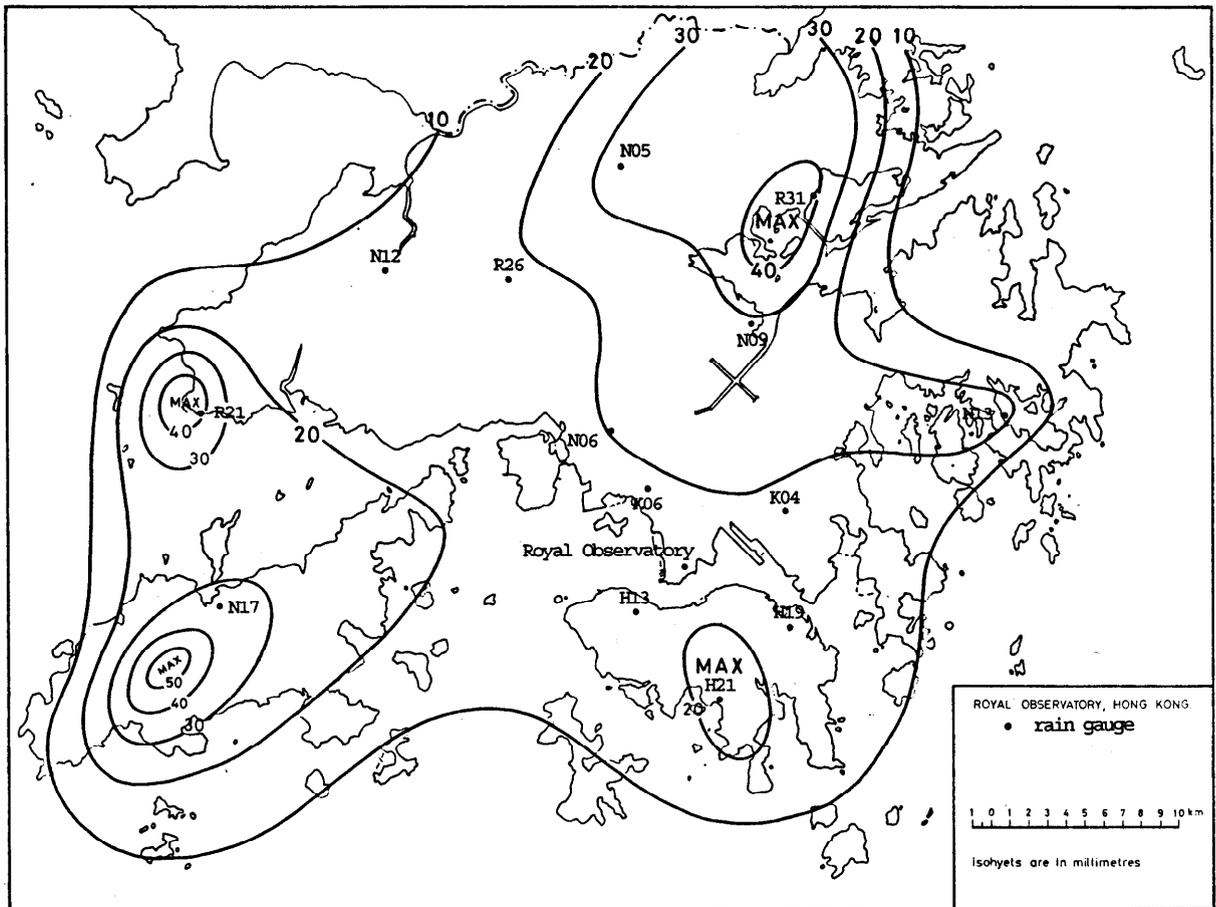


Figure 30. Rainfall distribution on 6 - 7 September 1995.

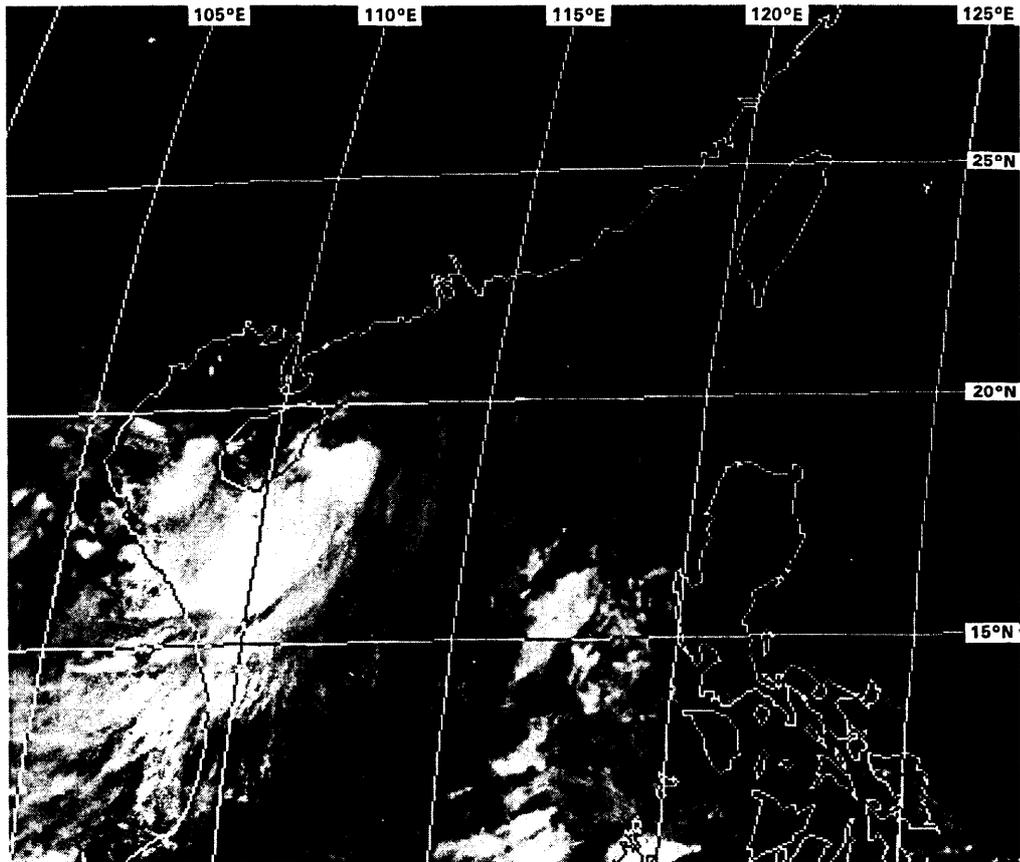


Figure 31. Infra-red imagery of Nina at around 2 a.m. on 7 September 1995 (originally by GMS of JMA).

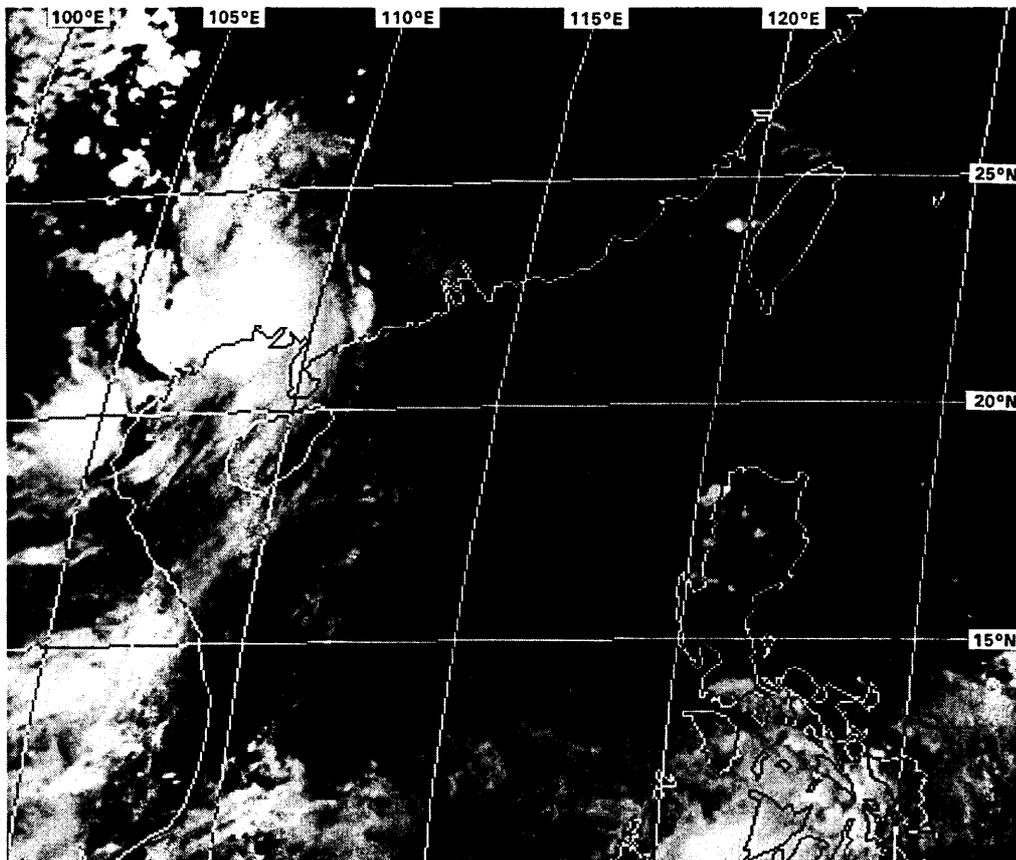


Figure 32. Infra-red imagery of Nina at around 5 p.m. on 7 September 1995 (originally captured by GMS of JMA).

**(g) Typhoon Ryan (9514)****16 - 24 September 1995**

The track of Ryan is shown in Figure 33

Ryan developed as a tropical depression about 410 km south-southeast of Xisha on 16 September. After remaining almost stationary for three days, Ryan started to move northwards on 19 September and attained typhoon strength. It adopted a northeastward track across the northern part of the South China Sea on 20 September. Ryan skirted past southern Taiwan on 22 September where it killed at least four people and cut electricity supplies to about 20 000 households. Ryan's circulation also affected the northern Philippines. Three fishermen died as their boat overturned in heavy seas.

Moving northeastwards with increasing speed, Ryan swept across southern Japan on the early morning of 24 September and became extratropical over the Sea of Japan that afternoon. Ryan caused considerable damage in Japan. An elderly woman was killed, five persons were injured and three reported missing. More than 950 houses were inundated and electricity supply to about 17 400 households was interrupted.

The track of Ryan was unusual in that it approached the south China coast from southwest to northeast. In Hong Kong the Stand By Signal No. 1 was hoisted at 10.15 p.m. on 19 September when Ryan began moving northwards. It turned northeastwards over the South China Sea on 20 September and accelerated early next morning. This track spared the territory from the gales and general strong winds of Ryan which by then was a full-fledged typhoon. But as Ryan traversed the northern part of the South China Sea, its peripheral circulation brought strong winds to hilltops and the offshore waters of Hong Kong even though throughout its passage Ryan remained at a considerable distance from the territory. Ryan was closest to Hong Kong at about 5 a.m. on 21 September when it was about 400 km to the south-southeast. The No. 1 signal was lowered at 11.30 a.m. on 21 September when Ryan was about 140 km south of Dongsha and no longer posed a threat to the territory. At the Royal Observatory Headquarters, the lowest hourly sea-level pressure of 1 006.8 hPa was recorded at 3 p.m. on 21 September.

No significant tropical cyclone damage was reported in Hong Kong during the passage of Ryan.

The rainfall distribution associated with Ryan is shown in Figure 34. Information on wind, rainfall and tide during the passage of Ryan is given as follows :

Maximum gust peak speeds and maximum hourly mean winds with associated wind directions recorded at various stations during the hoisting of the tropical cyclone warning signal for Ryan

<u>Station (see Fig. 1)</u>	<u>Maximum Gust</u>			<u>Maximum Hourly Wind</u>				
	<u>Direction</u>	<u>Speed (km/h)</u>	<u>Date</u>	<u>Time</u>	<u>Direction</u>	<u>Speed (km/h)</u>	<u>Date</u>	<u>Time</u>
Central	<b>ENE</b>	45	20 Sep	1842	<b>E</b>	23	20 Sep	1500
Cheung Chau	<b>NNE</b>	72	20 Sep	1908	<b>NNE</b>	45	20 Sep	2000
Cheung Sha Wan	<b>NNE</b>	63	20 Sep	2003	<b>N</b>	23	21 Sep	0800
Green Island	<b>NE</b>	63	20 Sep	2025	<b>NE</b>	49	20 Sep	2100
H.K. Airport (SE)	<b>ENE</b>	51	20 Sep	1442	<b>E</b>	22	20 Sep	1000
					<b>ENE</b>	22	20 Sep	1100
King's Park	<b>NE</b>	43	21 Sep	0740	<b>NE</b>	14	21 Sep	0900
					<b>NE</b>	14	21 Sep	1000
Ping Chau	<b>NNE</b>	30	21 Sep	0308	<b>NE</b>	13	20 Sep	2000
					<b>ENE</b>	13	20 Sep	2400
Sai Kung	<b>NNE</b>	58	20 Sep	1801	<b>NNE</b>	31	20 Sep	1800
	<b>NNE</b>	58	21 Sep	0907				
Sha Tin	<b>N</b>	45	20 Sep	1948	<b>NNE</b>	19	20 Sep	2400
Star Ferry	<b>E</b>	36	20 Sep	1502	<b>E</b>	16	20 Sep	1200
Ta Kwu Ling	<b>-</b>	43	21 Sep	1032	<b>-</b>	19	21 Sep	1100
Tai Mei Tuk	<b>NNE</b>	75	20 Sep	2100	<b>NE</b>	49	20 Sep	2100

Station (see Fig. 1)	Maximum Gust			Maximum Hourly Wind				
	Direction	Speed (km/h)	Date	Time	Direction	Speed (km/h)	Date	Time
Tai Mo Shan	N	88	20 Sep	2137	N	68	20 Sep	2200
Tap Mun	NE	45	20 Sep	1735	NE	23	20 Sep	1800
Tate's Cairn	NE	94	20 Sep	2043	NE	54	20 Sep	1800
Tseung Kwan O	NNE	52	21 Sep	1032	NNE	25	21 Sep	1000
Tsing Yi	NE	56	20 Sep	1946	NNE	27	20 Sep	2000
	NNE	56	20 Sep	1947				
Waglan Island	ENE	75	20 Sep	1124	ENE	59	20 Sep	1200
Wan Chai	NE	77	20 Sep	1753	NE	47	20 Sep	1800
Wong Chuk Hang	-	75	20 Sep	2027	-	25	20 Sep	1900
					-	25	20 Sep	2200

Stations with no record :

Lau Fau Shan  
Sha Lo Wan  
Tai Po Kau  
Tuen Mun

Daily rainfall amounts in millimetres recorded at the Royal Observatory and other stations on days when tropical cyclone warning signal was hoisted for Ryan :-

Station (see Fig. 34)	19 Sep	20 Sep	21 Sep	Total
Royal Observatory	0.8	0.8	Trace	1.6
H19 (HK Island (east))	Nil	4.0	Nil	4.0
H13 (HK Island (west))	1.5	2.0	Nil	3.5
H21 (HK Island (south))	Nil	3.0	Nil	3.0
K04 (Kowloon (east))	0.5	1.5	Nil	2.0
K06 (Kowloon (west))	0.5	0.5	Nil	1.0
N17 (Lantau)	Nil	1.0	N/A	[1.0]
N13 (Sai Kung)	5.5	4.5	Nil	10.0
N09 (Sha Tin)	1.0	0.5	2.0	3.5
R26 (Shek Kong)	Nil	0.5	Nil	0.5
N05 (Sheung Shui)	2.0	1.0	Nil	3.0
R31 (Tai Po)	[4.5]	0.5	[Nil]	[5.0]
N06 (Tsuen Wan - Kwai Chung)	1.5	Nil	Nil	1.5
R21 (Tuen Mun)	Nil	2.5	Nil	2.5
N12 (Yuen Long)	Nil	2.0	Nil	2.0

Note : [ ] based on incomplete hourly data.

N/A data not available.

Times and heights of the maximum sea level and the maximum storm surge recorded at tide stations in Hong Kong during the passage of Ryan :-

Station (see Fig. 1)	Maximum sea level above chart datum			Maximum storm surge above astronomical tide		
	Height (m)	Date	Time	Height (m)	Date	Time
Tai Po Kau	2.48	21 Sep	7.28 a.m.	0.59	21 Sep	3.19 a.m.

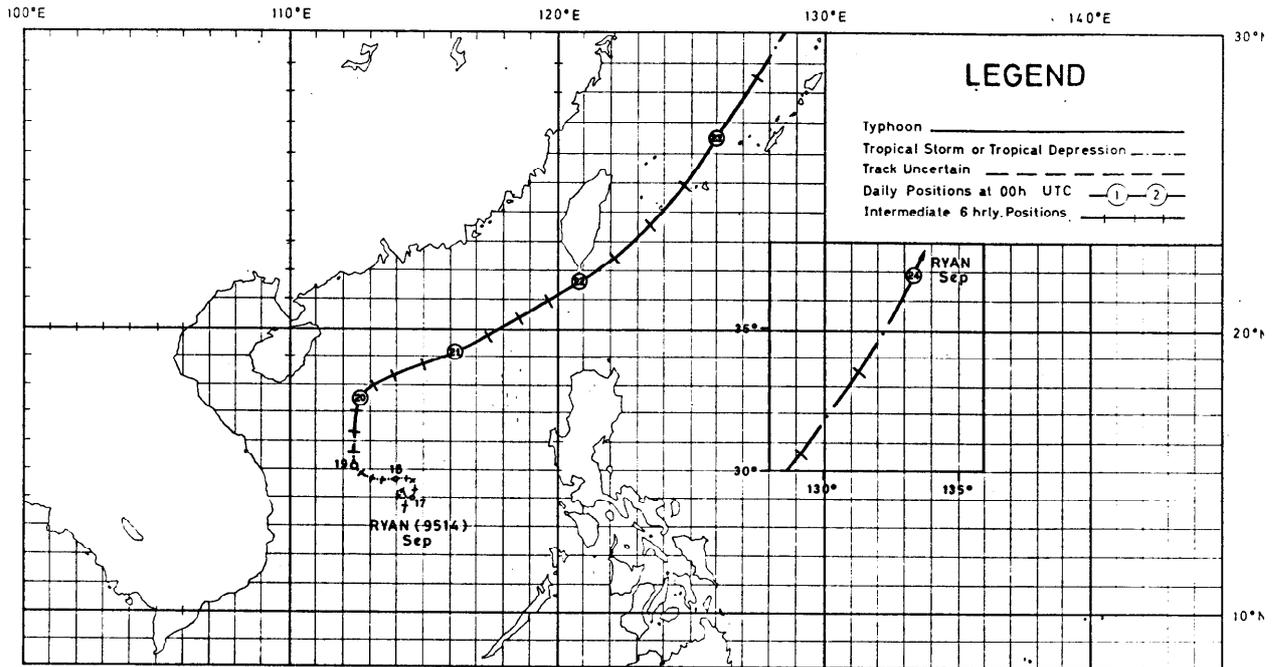


Figure 33. Track of Typhoon Ryan (9514) : 16 - 24 September 1995.

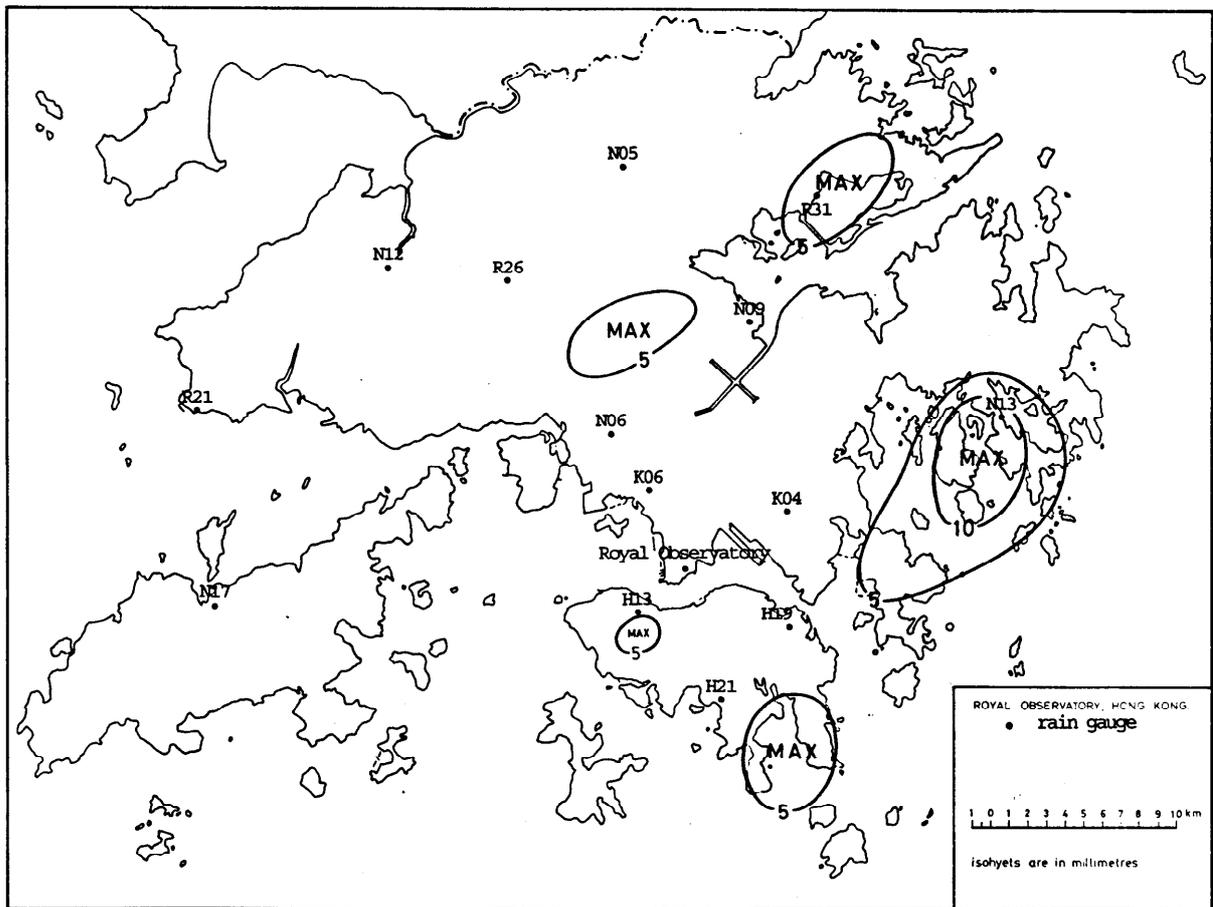


Figure 34. Rainfall distribution on 19 - 21 September 1995.

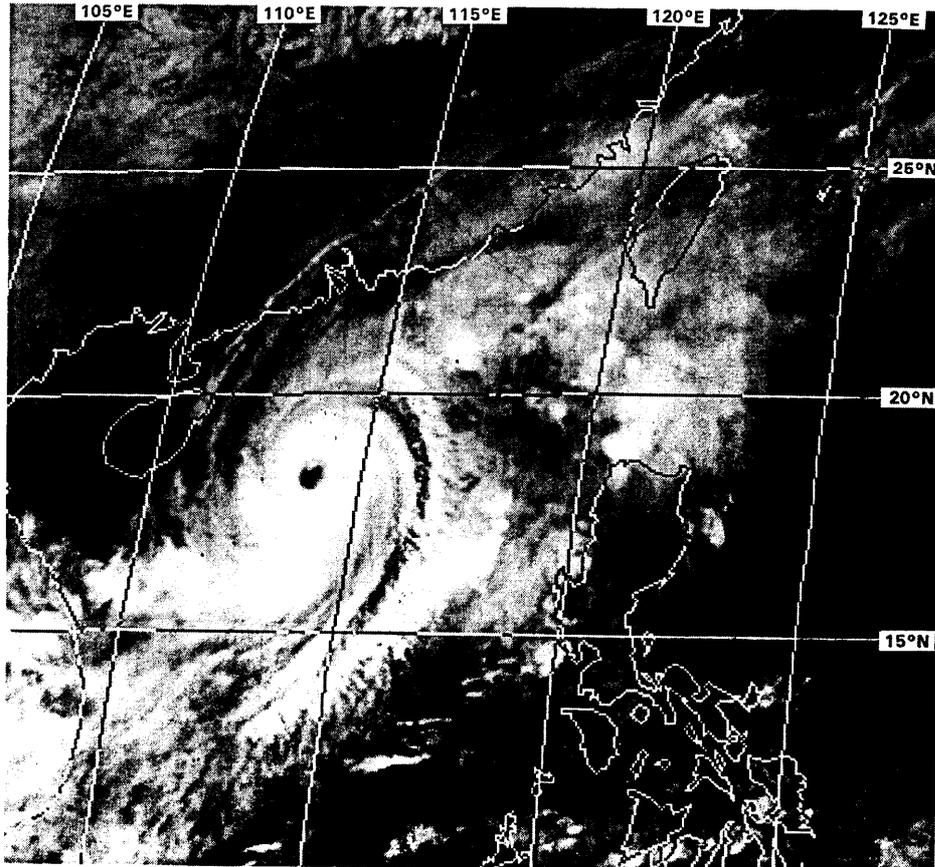


Figure 35. Infra-red imagery of Ryan at around 8 p.m. on 20 September 1995 (originally captured by GMS of JMA).

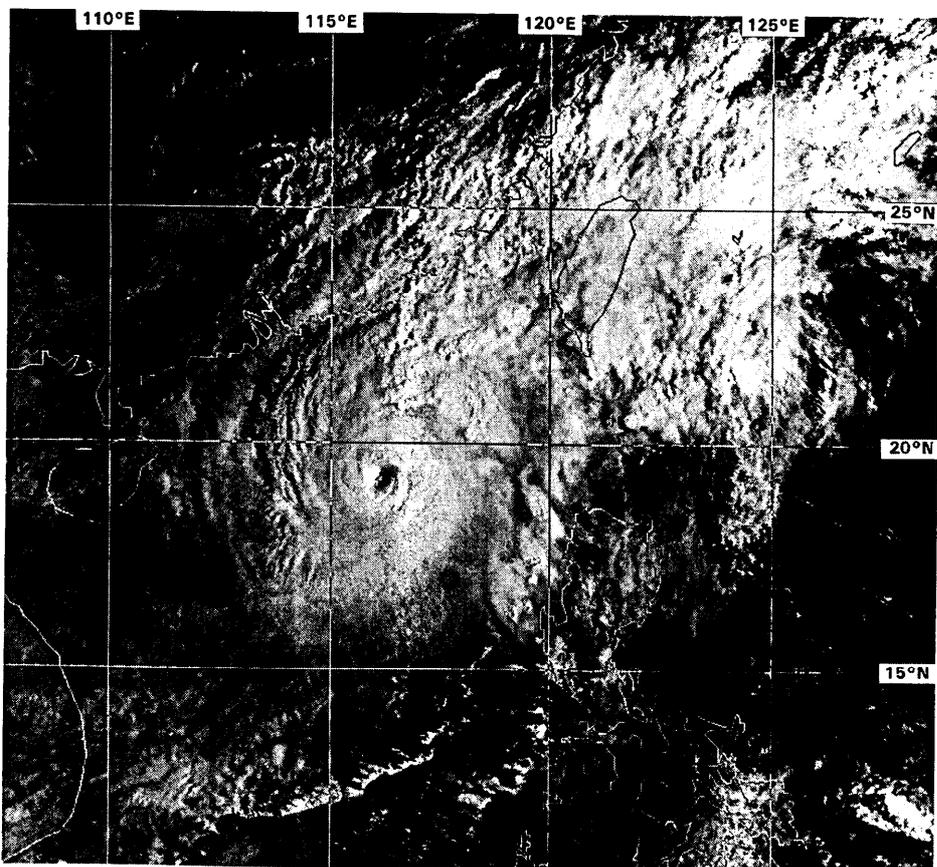


Figure 36. Visible imagery of Ryan at around 8 a.m. on 21 September 1995 (originally captured by GMS of JMA).

## (h) Typhoon Sibyl (9515)

### 28 September - 4 October 1995

The track of Sibyl is shown in Figure 37

Sibyl formed as a tropical depression about 1 170 km east-southeast of Manila on 28 September. Moving west-northwestwards, it rampaged across the Philippines during the next two days and inflicted serious damage on the islands. Heavy rain triggered flash floods, landslides and mudflows from Mount Pinatubo. At least 100 people were killed, another 100 went missing and 234 000 people were made homeless. Leaving the Philippines, Sibyl entered the South China Sea on 1 October. After attaining typhoon strength on the afternoon of 2 October, Sibyl moved west-northwestwards and then turned north-northwestwards on the early morning of 3 October. It made landfall over the coast of western Guangdong that afternoon and dissipated over land the next day.

In China at least eight people died in the fury of Sibyl. Apart from collapsed houses, many roads and bridges were damaged. More than 180 000 hectares of farmland were ruined. The direct economic loss was estimated at 1.32 billion RMB.

In Macau collapsed scaffoldings and toppled trees damaged two vehicles, but fortunately no one was injured.

In Hong Kong the Stand By Signal No. 1 was hoisted at 5.45 p.m. on 1 October when Sibyl was about 720 km to the south-southeast. The weather was mainly fine and winds were moderate from the east. As winds strengthened and squally showers set in, the Strong Wind Signal No.3 was hoisted at 12.30 p.m. the next day. Sibyl moved west-northwestwards that evening, but started to turn north-northwestwards on the early morning of 3 October, thereby coming closer to the territory. At the same time, Sibyl intensified and winds were generally strong and gusty. The No.8 SOUTHEAST Gale or Storm Signal was hoisted at 5.10 a.m. to warn of gales occurring in squalls affecting the territory during the morning rush hours. As winds started to decrease later in the morning, the No.8 signal was replaced by the Strong Wind Signal No.3 at 11.30 a.m. Sibyl made landfall over the coast of western Guangdong in the afternoon and all signals were lowered at 8.45 p.m. Sibyl was closest to Hong Kong at about 8 a.m. on 3 October when it was about 290 km to the southwest. At the Royal Observatory Headquarters, the lowest hourly sea-level pressure of 1 003.4 hPa was recorded at 3 a.m. on 3 October.

Locally the high winds of Sibyl brought down trees and scaffoldings. Three cars parked on Gascoigne Road in Kowloon were hit by a toppled tree. A large section of scaffolding in Shek Yam Estate in Kwai Chung collapsed, but fortunately no one was injured. Heavy rain also brought flash floods to the northern part of the New Territories, including Yuen Long, Sha Tau Kok, Sheung Shui and Fan Ling. The most serious flooding occurred at Ying Kong Tsuen in Sheung Shui where 25 people stranded by floods were rescued by firemen. The passage of Sibyl caused about 320 hectares of farmland to be inundated. A total of 14 people were injured in various storm-related accidents.

The rainfall distribution associated with Sibyl is shown in Figure 38. Information on wind, rainfall and tide during the passage of Sibyl is given as follows :

Maximum gust peak speeds and maximum hourly mean winds with associated wind directions recorded at various stations during the hoisting of tropical cyclone warning signals for Sibyl :-

Station (see Fig. 1)	Maximum Gust		Date	Time	Maximum Hourly Wind		Date	Time		
	Direction	Speed (km/h)			Direction	Speed (km/h)				
Central	<b>ESE</b>	88	3	Oct	0135	<b>E</b>	43	2	Oct	1600
Cheung Chau	<b>ESE</b>	133	3	Oct	0341	<b>E</b>	83	3	Oct	0400
Cheung Sha Wan	<b>ENE</b>	104	3	Oct	0241	<b>ENE</b>	40	3	Oct	0400
Green Island	<b>ESE</b>	121	3	Oct	0725	<b>E</b>	70	2	Oct	1800
H.K. Airport (SE)	<b>E</b>	108	3	Oct	0437	<b>E</b>	51	3	Oct	0500
						<b>E</b>	51	3	Oct	0600
						<b>ESE</b>	51	3	Oct	0700
						<b>ESE</b>	51	3	Oct	0800
King's Park	<b>E</b>	94	3	Oct	0307	<b>ESE</b>	34	3	Oct	0700
Ping Chau	<b>ESE</b>	96	3	Oct	0710	<b>E</b>	45	3	Oct	0400
Sai Kung	<b>ENE</b>	101	3	Oct	0103	<b>ENE</b>	65	3	Oct	0400
Sha Lo Wan	<b>ENE</b>	155	3	Oct	0355	<b>E</b>	70	3	Oct	0200
	<b>E</b>	155	3	Oct	0400					
Sha Tin	<b>ENE</b>	99	3	Oct	0329	<b>ENE</b>	31	3	Oct	0400
Star Ferry	<b>ESE</b>	96	3	Oct	0609	<b>ESE</b>	54	3	Oct	1000
Ta Kwu Ling	-	104	3	Oct	0523	-	36	3	Oct	0600
Tai Mei Tuk	<b>ENE</b>	126	3	Oct	0423	<b>ENE</b>	85	3	Oct	0500
Tai Mo Shan	<b>ENE</b>	176	3	Oct	0344	<b>ENE</b>	113	3	Oct	0400
Tai Po Kau	<b>E</b>	101	3	Oct	0439	<b>E</b>	59	3	Oct	0400
Tap Mun	<b>E</b>	113	3	Oct	0451	<b>E</b>	62	3	Oct	0600
Tate's Cairn	-	142	2	Oct	1855	-	81	2	Oct	1900
Tseung Kwan O	<b>E</b>	87	3	Oct	0328	<b>SSE</b>	31	3	Oct	1400
Tsing Yi	<b>E</b>	149	3	Oct	0024	<b>SE</b>	68	3	Oct	0700
	<b>E</b>	149	3	Oct	0051					
Waglan Island	<b>E</b>	115	3	Oct	0241	<b>E</b>	90	3	Oct	0300
Wan Chai	<b>ENE</b>	140	3	Oct	0255	<b>SE</b>	70	3	Oct	0800
Wong Chuk Hang	-	106	3	Oct	0716	-	40	2	Oct	2200

Stations with no record :  
Lau Fau Shan  
Tuen Mun

Daily rainfall amounts in millimetres recorded at the Royal Observatory and other stations during the passage of Sibyl :-

Station (see Fig. 38)	<u>1 Oct</u>	<u>2 Oct</u>	<u>3 Oct</u>	<u>4 Oct</u>	<u>Total</u>
Royal Observatory	Trace	79.3	106.4	8.4	194.1
H19 (HK Island (east))	Nil	85.5	65.5	7.0	158.0
H13 (HK Island (west))	Nil	117.0	153.0	2.0	272.0
H21 (HK Island (south))	Nil	104.5	117.0	4.0	225.5
K04 (Kowloon (east))	Nil	95.5	100.0	6.0	201.5
K06 (Kowloon (west))	Nil	101.0	94.0	9.0	204.0
N17 (Lantau)	Nil	69.0	N/A	Nil	[69.0]
N13 (Sai Kung)	N/A	N/A	N/A	N/A	N/A
N09 (Sha Tin)	Nil	100.5	91.5	10.0	202.0
R26 (Shek Kong)	[Nil]	126.5	151.0	15.0	[292.5]
N05 (Sheung Shui)	Nil	75.5	83.0	19.0	177.5
R31 (Tai Po)	[Nil]	104.0	[16.5]	N/A	[120.5]
N06 (Tsuen Wan - Kwai Chung)	Nil	113.0	137.5	6.5	257.0
R21 (Tuen Mun)	[Nil]	[34.0]	138.5	Nil	[172.5]
N12 (Yuen Long)	Nil	80.5	166.5	2.0	249.0

Note : [ ] based on incomplete hourly data.  
N/A data not available.

Times and heights of the maximum sea level and the maximum storm surge recorded at tide stations in Hong Kong during the passage of Sibyl :-

Station (see Fig. 1)	Maximum sea level above chart datum			Maximum storm surge above astronomical tide		
	Height (m)	Date	Time	Height (m)	Date	Time
Lok On Pai	2.84	3 Oct	4.07 a.m.	0.65	3 Oct	4.07 a.m.
Tai Po Kau	3.00	3 Oct	4.41 a.m.	0.80	2 Oct	11.37 p.m.
Tsim Bei Tsui	2.81	3 Oct	5.03 a.m.	0.45	3 Oct	5.03 a.m.
Waglan Island	2.72	3 Oct	4.10 a.m.	0.52	3 Oct	4.10 a.m.

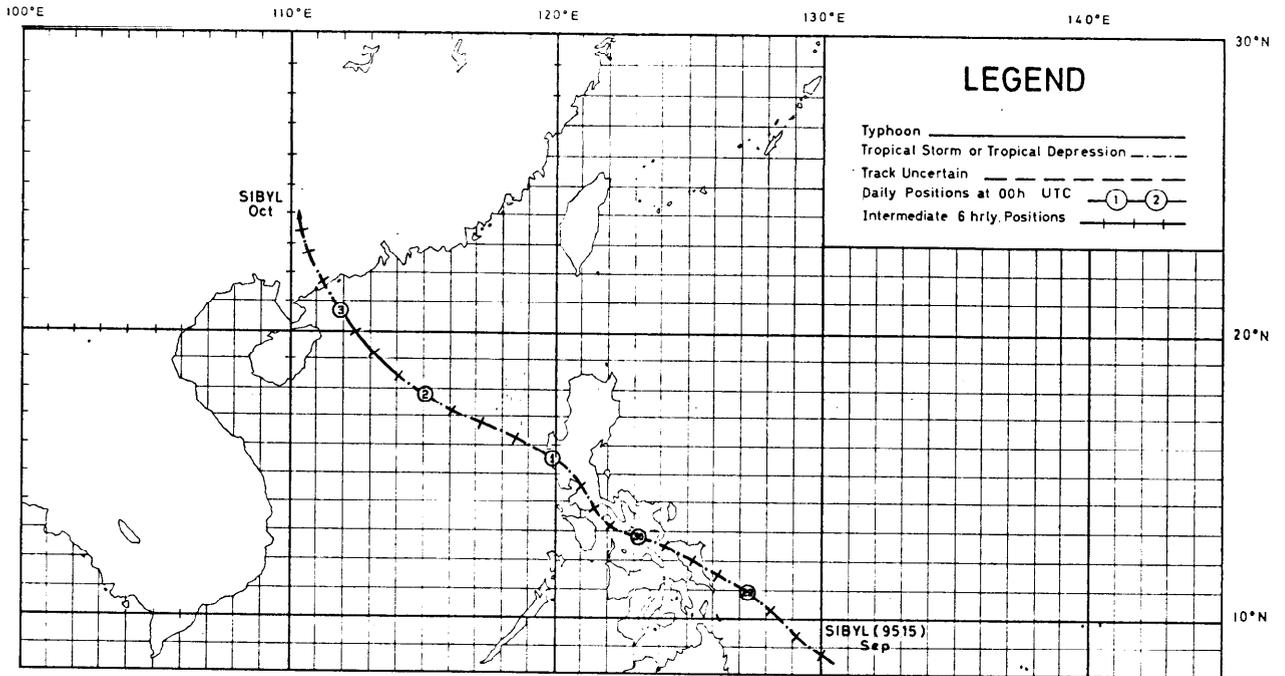


Figure 37. Track of Typhoon Sibyl (9515) : 28 September - 4 October 1995.

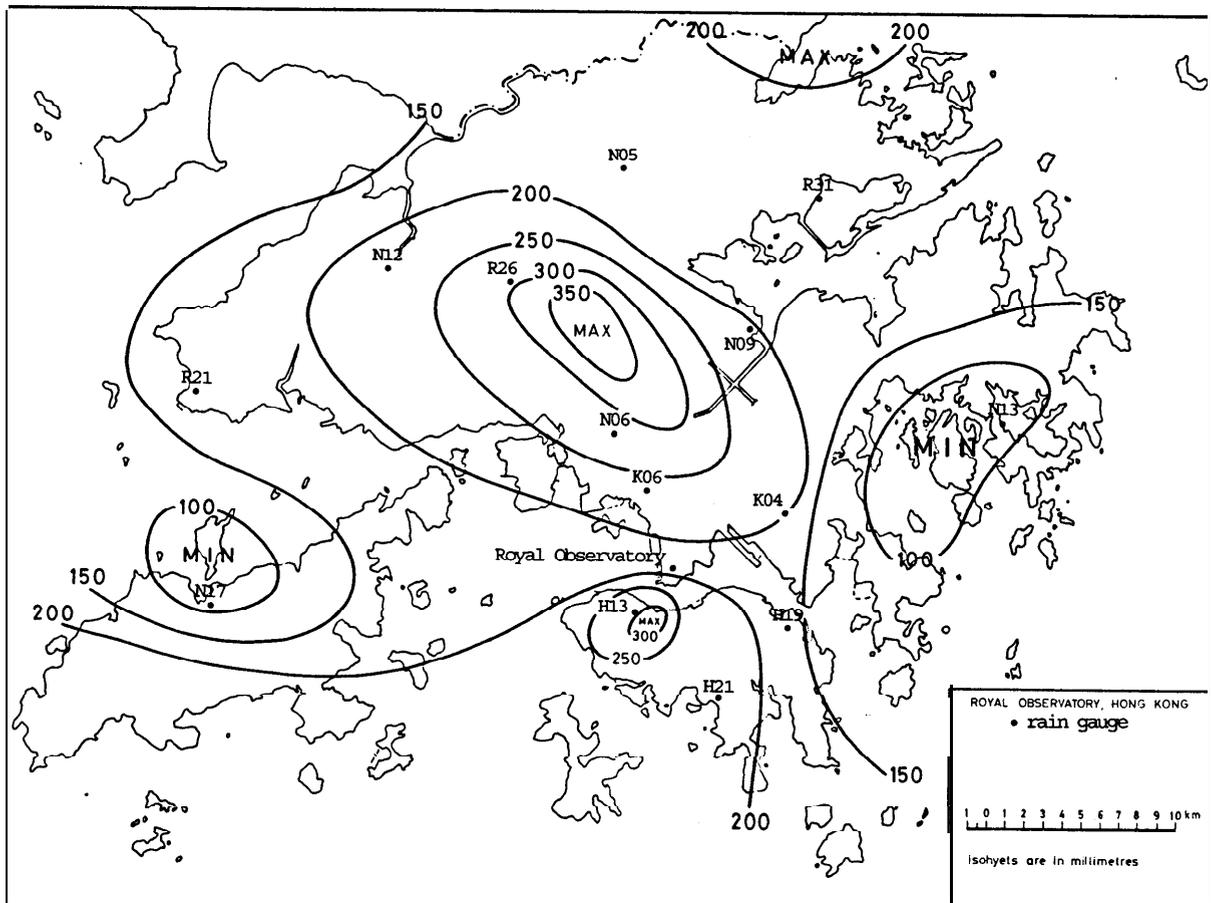


Figure 38. Rainfall distribution on 1 - 4 October 1995.

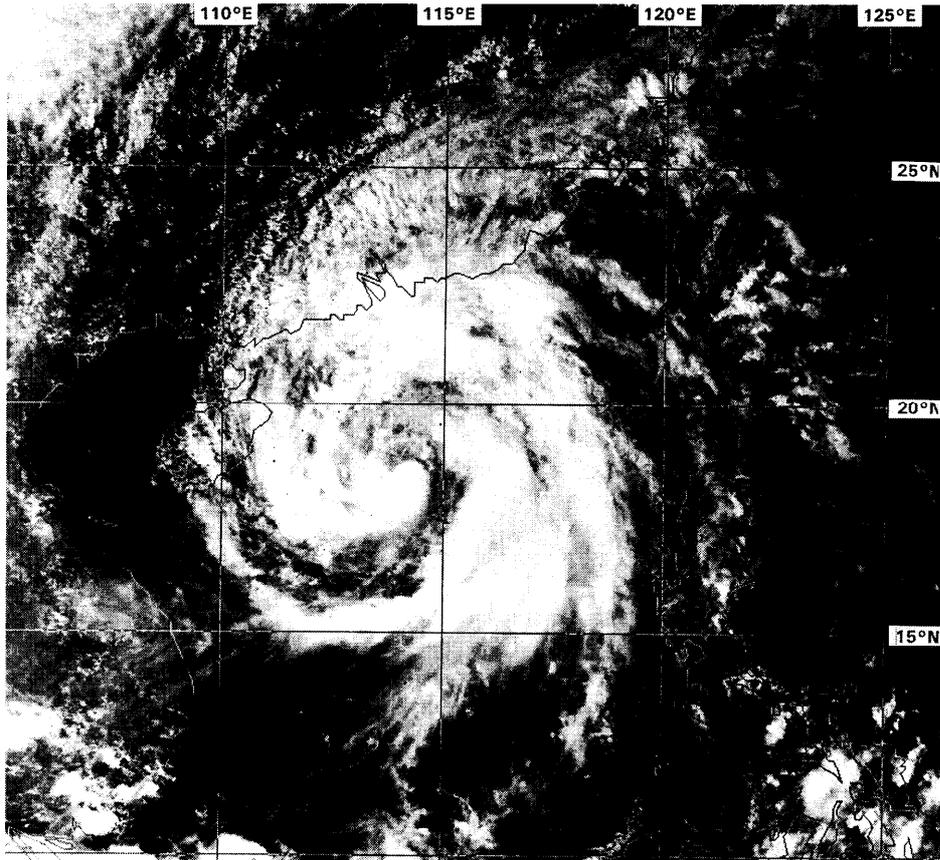


Figure 39. Visible imagery of Sibyl at around 2 p.m. on 2 October 1995 (originally captured by GMS of JMA).

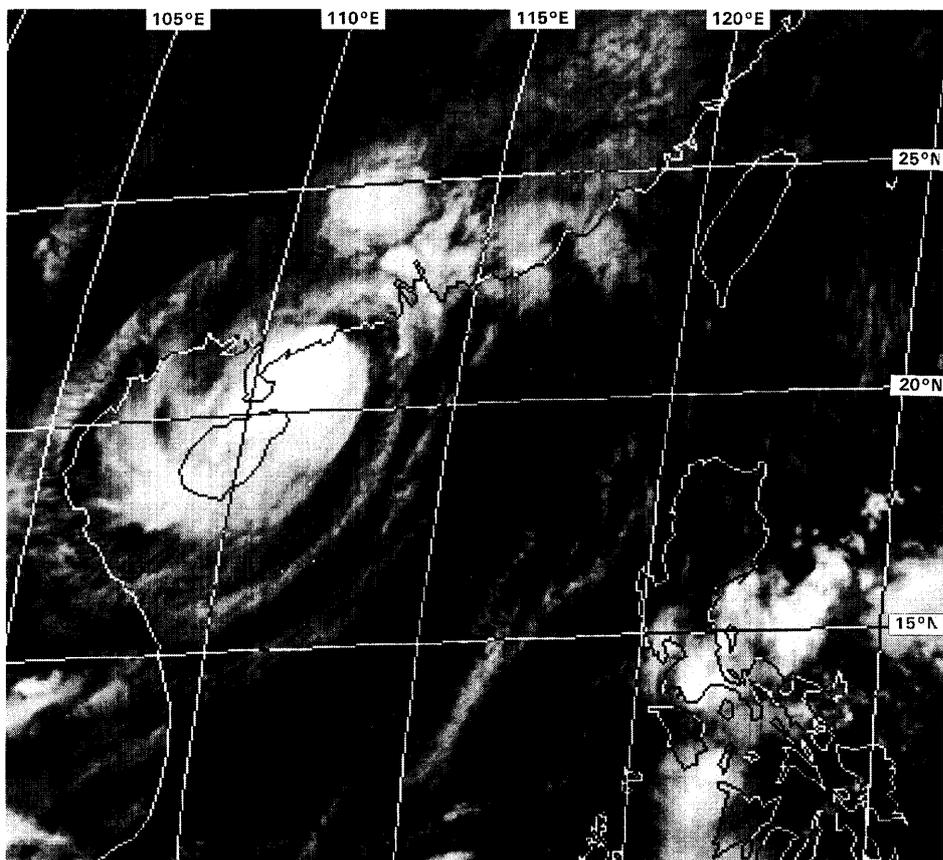


Figure 40. Infra-red imagery of Sibyl at around 11 a.m. on 3 October 1995 (originally captured by GMS of JMA).

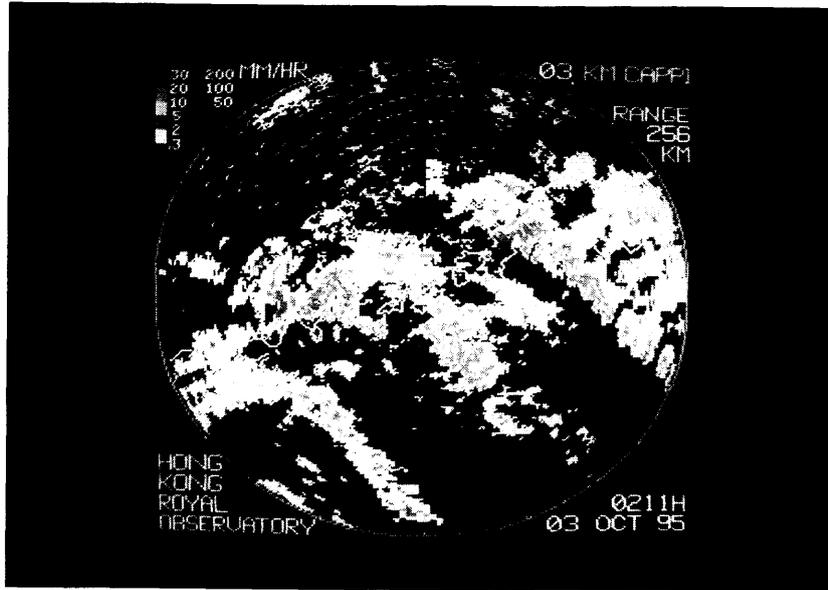


Figure 41. Radar display of the rain echoes of Sibyl at 2.11 a.m. on 3 October 1955.



Figure 42. A large collapsed section of scaffolding in Shek Yam Estate, Kwai Chung (by courtesy of Sing Tao Daily).

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132 Nathan Road, Tsim Sha Tsui, Kowloon.  
(Tel.: 2926 8250)

Figure 43. Cars parked on Gascoigne Road in Kowloon hit by a toppled tree (by courtesy of Sing Tao Daily).

## **Section 4**

# **TROPICAL CYCLONE STATISTICS AND TABLES**

TABLE 1 is a list of tropical cyclones in 1995 in the western North Pacific and the adjacent seas (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 2 gives the number of tropical cyclone warnings for shipping issued by the Royal Observatory in 1995, 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 3 presents a summary of the occasions/durations of the hoisting of tropical cyclone warning signals in 1995. 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 presents a summary of the occasions/durations of the hoisting of tropical cyclone warning signals from 1956 to 1995 inclusive.

TABLE 5 gives the annual number of tropical cyclones in Hong Kong's area of responsibility between 1956 and 1995. The annual number of tropical cyclones causing tropical cyclone warning signals to be raised in Hong Kong is also included.

TABLE 6 shows the maximum, mean and minimum durations of the tropical cyclone warning signals hoisted during the period 1956-1995.

TABLE 7 is a summary of meteorological information for each tropical cyclone affecting Hong Kong in 1995. Information on the nearest approach together with an estimate of the minimum central pressure of each tropical cyclone during its closest approach, the maximum winds at King's Park and Waglan Island, the minimum mean sea-level pressure recorded at the Royal Observatory and the maximum storm surge (the excess, in metres, of the actual water level over that predicted in the Tide Tables) are included.

TABLE 8 tabulates the amount of rainfall associated with each tropical cyclone that came within 600 km of Hong Kong in 1995 and highlights the 10 wettest tropical cyclones in Hong Kong for the period 1884-1939 and 1947-1995.

TABLE 9 provides some meteorological information for those typhoons requiring the hoisting of the Hurricane Signal No. 10 in Hong Kong since 1946. The information presented includes the distances and bearings of nearest approach, the minimum mean sea-level pressures recorded at the Royal Observatory and the maximum 60-minute mean winds and maximum gust peak speeds recorded at some stations in Hong Kong.

TABLE 10 contains damage caused by tropical cyclones in 1995. The information is based on reports from various government departments, public utility companies and local newspapers.

TABLE 11 presents the casualties and damage figures associated with tropical cyclones in Hong Kong for the past 30 years. The information is based on reports from various government departments, public utility companies and local newspapers.

TABLE 1. LIST OF TROPICAL CYCLONES I-N THE WESTERN NORTH PACIFIC AND THE SOUTH CHINA SEA IN 1995

Name of tropical cyclone	Beginning of track			End of track			Remark
	Date	Time UTC	Position °N °E	Date	Time UTC	Position °N °E	
Tropical Depression	8	Jan 0000	8.0 175.6	8	Jan 1800	10.0 173.4	Dissipated
Tropical Storm Chuck (9501)	27	Apr 1800	5.2 166.1	2	May 0000	8.8 160.8	Dissipated
Tropical Storm Deanna (9502)	1	Jun 0000	10.0 129.5	8	Jun 1200	23.7 120.8	Dissipated
Tropical Depression Eli	4	Jun 0600	12.9 144.6	8	Jun 1800	23.0 138.0	Dissipated
Typhoon Faye (9503)	17	Jul 1200	18.4 139.8	24	Jul 1200	41.3 136.0	Became Extratropical
Severe Tropical Storm Gary (9504)	27	Jul 0600	15.8 122.5	31	Jul 1800	27.0 116.0	Dissipated
Severe Tropical Storm Helen (9505)	7	Aug 0600	14.3 132.0	12	Aug 1200	24.1 114.5	Dissipated
Tropical Storm Irving (9506)	17	Aug 0600	15.8 112.5	20	Aug 0000	21.3 109.7	Dissipated
Severe Tropical Storm Janis (9507)	21	Aug 1200	19.9 130.1	26	Aug 0000	34.0 122.6	Became Extratropical
Typhoon Kent (9508)	25	Aug 1200	13.2 130.0	1	Sep 0000	24.2 109.9	Dissipated
Severe Tropical Storm Lois (9509)	26	Aug 0000	17.5 115.0	30	Aug 0600	18.8 104.0	Dissipated
Typhoon Mark (9510)	30	Aug 0000	28.3 152.1	2	Sep 0600	40.5 172.7	Became Extratropical
Tropical Storm Nina (9511)	2	Sep 1200	11.5 129.4	7	Sep 1200	23.0 108.4	Dissipated
Tropical Depression	9	Sep 0600	13.3 113.5	10	Sep 1800	14.5 109.5	Dissipated
Typhoon Oscar (9512)	11	Sep 1800	14.6 148.2	17	Sep 1200	40.0 146.3	Became Extratropical
Typhoon Polly (9513)	14	Sep 1800	17.0 123.6	21	Sep 1800	39.0 159.3	Became Extratropical
Typhoon Ryan (9514)	16	Sep 0600	13.7 114.3	24	Sep 0000	36.9 134.3	Became Extratropical
Typhoon Sibyl (9515)	28	Sep 0600	8.8 130.0	3	Oct 1800	23.5 110.3	Dissipated
Tropical Storm Ted (9516)	9	Oct 0000	15.0 116.8	13	Oct 1800	23.0 110.5	Dissipated
Tropical Storm Val (9517)	10	Oct 0000	21.8 144.2	13	Oct 1200	24.2 138.6	Dissipated
Typhoon Ward (9518)	16	Oct 1200	13.0 152.2	22	Oct 0600	31.0 144.0	Became Extratropical
Severe Tropical Storm Yvette (9519)	22	Oct 1800	10.5 130.0	26	Oct 1800	13.5 105.7	Dissipated
Typhoon Zack (9521)	25	Oct 0000	8.0 138.6	1	Nov 1800	14.2 105.2	Dissipated
Typhoon Angela (9520)	25	Oct 1200	10.2 148.2	6	Nov 1200	18.5 109.1	Dissipated
Tropical Storm Brian (9522)	1	Nov 0000	18.8 156.8	3	Nov 1200	31.8 160.8	Dissipated
Tropical Depression Colleen	11	Nov 1200	20.2 180.0	12	Nov 1800	16.7 176.0	Dissipated
Tropical Depression	3	Dec 0000	14.5 126.2	4	Dec 1200	13.4 124.1	Dissipated
Tropical Depression	9	Dec 1200	8.9 115.8	11	Dec 0600	8.5 112.2	Dissipated
Severe Tropical Storm Dan (9523)	25	Dec 0600	8.1 134.2	31	Dec 0000	22.5 141.8	Became Extratropical

TABLE 2. TROPICAL CYCLONE WARNINGS FOR SHIPPING ISSUED IN 1995

Tropical cyclone	No. of warnings issued	Date and time <sup>+</sup> of issue of				Duration of warnings (hours)
		First warning		Last warning		
Tropical Storm Deanna	53	2 Jun 0600	8 Jun 1800		156	
* Severe Tropical Storm Gary	33	27 Jul 1200	31 Jul 1200		96	
* Severe Tropical Storm Helen	30	9 Aug 0000	12 Aug 0900		81	
* Tropical Storm Irving	21	17 Aug 1500	20 Aug 0300		60	
Severe Tropical Storm Janis	16	23 Aug 1200	25 Aug 0900		45	
* Severe Tropical Storm Lois	30	26 Aug 0600	29 Aug 2100		87	
* Typhoon Kent	24	29 Aug 0000	31 Aug 1800		66	
* Tropical Storm Nina	30	3 Sep 1500	7 Sep 0600		87	
Tropical Depression	6	9 Sep 0600	9 Sep 2100		15	
Typhoon Polly	7	14 Sep 2100	15 Sep 1500		18	
* Typhoon Ryan	53	16 Sep 0600	22 Sep 1800		156	
* Typhoon Sibyl	35	29 Sep 1500	3 Oct 1500		96	
Tropical Storm Ted	28	10 Oct 0300	13 Oct 0900		78	
Severe Tropical Storm Yvette	20	23 Oct 2100	26 Oct 0600		57	
Typhoon Zack	35	28 Oct 0600	1 Nov 1200		102	
Typhoon Angela	36	2 Nov 0900	6 Nov 1800		105	
Tropical Depression	9	4 Dec 0000	5 Dec 0000		24	
Total	466				1329	

\* Tropical cyclones for which tropical cyclone warning signals were hoisted in H.K.

<sup>+</sup> Times are given in hours UTC

TABLE 3. TROPICAL CYCLONE WARNING SIGNALS HOISTED IN HONG KONG AND NUMBER OF WARNING BULLETINS ISSUED IN 1995

## SUMMARY

Signal	No. of occasions	Total duration
1	8	260 h 35 min
3	6	58 h 10 min
8 NORTHWEST	2	9 h 00 min
8 SOUTHWEST	2	8 h 45 min
8 NORTHEAST	1	6 h 00 min
8 SOUTHEAST	1	6 h 20 min
9	-	-
10	-	-
Total	20	348 h 50 min

## DETAILS

Tropical cyclone	No. of warning bulletins issued	Signal	Hoisted		Lowered	
			Date	Time*	Date	Time*
Severe Tropical Storm Gary	72	1	28 Jul	1545	31 Jul	1430
Severe Tropical Storm Helen	56	1	9 Aug	1600	11 Aug	0545
		3	11 Aug	0545	11 Aug	2230
		8 NE	11 Aug	2230	12 Aug	0430
		8 NW	12 Aug	0430	12 Aug	0945
		8 SW	12 Aug	0945	12 Aug	1415
		3	12 Aug	1415	12 Aug	1730
Tropical Storm Irving	36	1	18 Aug	1230	19 Aug	2345
Severe Tropical Storm Lois	22	1	27 Aug	1315	28 Aug	0935
Typhoon Kent	39	1	30 Aug	1200	31 Aug	0400
		3	31 Aug	0400	31 Aug	1300
		8 NW	31 Aug	1300	31 Aug	1645
		8 SW	31 Aug	1645	31 Aug	2100
		3	31 Aug	2100	1 Sep	0015
Tropical Storm Nina	25	1	6 Sep	0945	7 Sep	1015
Typhoon Ryan	39	1	19 Sep	2215	21 Sep	1130
Typhoon Sibyl	54	1	1 Oct	1745	2 Oct	1230
		3	2 Oct	1230	3 Oct	0510
		8 SE	3 Oct	0510	3 Oct	1130
		3	3 Oct	1130	3 Oct	2045

\* Hong Kong Time (UTC + 8)

TABLE 4. FREQUENCY AND TOTAL DURATION OF DISPLAY OF TROPICAL CYCLONE WARNING SIGNALS : 1956 - 1995

Signals Year	1	3	8 NW	8 SW	8 NE	8 SE	9	10	Total duration h 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
Total	265	239	13	20	47	36	13	11	11337 49
Mean	6.6	6.0	0.3	0.5	1.2	0.9	0.3	0.3	283 27

TABLE 5. 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 - 1995

Year	Number in Hong Kong's Area of responsibility	Number 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	21	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
<b>Total</b>	<b>654</b>	<b>252</b>
<b>Mean</b>	<b>16.4</b>	<b>6.3</b>

TABLE 6. DURATION OF TROPICAL CYCLONE WARNING SIGNALS HOISTED IN HONG KONG : 1956 - 1995

Signal hoisted	Number of occasions	Duration of each occasion			Total duration per year		
		Mean h min	Maximum h min	Minimum h min	Mean h min	Maximum h min	Minimum h min
1 or higher	262	43 16	161 0	9 35	283 27	570 15	36 35
3 or higher	182	31 3	124 15	6 55	141 16	306 35	23 55
8 or higher	59	16 10	66 50	2 40	23 51	100 55	0 0
8 NW	13	6 29	15 45	1 30	2 7	15 45	0 0
8 SW	20	5 12	10 45	2 30	2 36	16 10	0 0
8 NE	47	8 28	35 35	2 35	9 57	40 20	0 0
8 SE	36	7 23	21 45	0 20	6 39	31 15	0 0
9 or higher	14	7 18	11 33	3 35	2 33	19 25	0 0
10	11	6 10	9 10	2 30	1 42	12 10	0 0

TABLE 7. A SUMMARY OF METEOROLOGICAL OBSERVATIONS RECORDED IN HONG KONG DURING THE PASSAGES OF TROPICAL CYCLONES IN 1995

(a)

Name of tropical cyclone	Month	Nearest approach to Hong Kong						Minimum hourly M.S.L. pressure at the Royal Observatory				Maximum storm surge (metres)							
		Day	Hour*	Direction	Distance (km)	Movement (km/h)	Estimated minimum central pressure (hPa)	Month	Day	Hour*	Pressure (hPa)	Chi Ma Wan	Ko Lau Wan	Lok On Pai	Quarry Bay	Tai O	Tai Po Kau	Tsim Bei Tsui	Waglan Island
S.T.S. Gary	Jul	31	8	E	290	N 25	980	Jul	31	4	996.7	-	-	0.39	0.51	-	-	0.56	0.57
S.T.S. Helen	Aug	12	7	E	50	N 19	980	Aug	12	7	993.0	-	-	0.29	0.55	-	1.00#	0.77	0.64
T.S. Irving	Aug	19	8	SW	400	NW 12	996	Aug	19	17	1007.4	-	-	-	-	-	0.21	-	0.17
S.T.S. Lois	Aug	26	14	S	530	W 13	998	Aug	26	16,17	1002.6	-	-	-	0.35	-	-	-	0.34
T. Kent	Aug	31	17	NNE	80	WNW 31	975	Aug	31	16	991.3	-	-	-	0.48	-	-	-	0.51
T.S. Nina	Sep	7	5	SW	380	NW 23	994	Sep	6	4,5,6	1003.4	-	-	-	0.20	-	0.38	-	-
T. Ryan	Sep	21	5	SSE	400	ENE 23	945	Sep	21	15	1006.8	-	-	-	-	-	0.59	-	-
T. Sibyl	Oct	3	8	SW	290	NNW 19	970	Oct	3	3	1003.4	-	-	0.65	-	-	0.80	0.45	0.52

\* Hong Kong Time (UTC + 8)

# underestimated due to missing data around the time of maximum surge and sea level.

(b)

Name of tropical cyclone	Month	Maximum 60-min mean wind in points and km/h		Maximum 10-min mean wind in points and km/h		Maximum gust peak speed in km/h with direction in points	
		King's Park	Waglan Island	King's Park	Waglan Island	King's Park	Waglan Island
S.T.S. Gary	Jul	W 13	W 45	WNW 14	W 51	E, ESE 34	WNW 65
S.T.S. Helen	Aug	WNW 31	NE 104	WNW 36	NNE 106	ENE, NE 79	NE 139
T.S. Irving	Aug	SE 14	E 31	ESE 16	E 31	E 34	E 38
S.T.S. Lois	Aug	ESE 23	E 51	ESE 31	E 58	ESE 62	E 92
T. Kent	Aug	WNW 23	W 72	WNW 27	W 79	W 72	WNW 101
T.S. Nina	Sep	ESE 19	ESE 45	ESE 20	ESE 49	SE 45	SE 59
T. Ryan	Sep	NE 14	ENE 62	NE 19	ENE 63	NE 43	ENE 75
T. Sibyl	Oct	SE 34	E 90	SE 43	E 94	E 94	E 115

TABLE 8 (a). RAINFALL ASSOCIATED WITH TROPICAL CYCLONES THAT CAME WITHIN 600 KM OF HONG KONG (WITH OR WITHOUT HOISTING OF TROPICAL CYCLONE WARNING SIGNALS) IN 1995

Name of tropical cyclone	Period* when tropical cyclone within 600 km of Hong Kong (T <sub>1</sub> → T <sub>2</sub> )	Rainfall at the Royal Observatory (mm)				
		(i) 600 km (T <sub>1</sub> → T <sub>2</sub> )	(ii) 24 hours after T <sub>2</sub>	(iii) 48 hours after T <sub>2</sub>	(iv) 72 hours after T <sub>2</sub>	(i) + (iv) Total T <sub>1</sub> → (T <sub>2</sub> + 72 hours)
T.S. Deanna #	(T <sub>1</sub> ) 5 Jun 2300 - (T <sub>2</sub> ) 8 Jun 1600	19.8	42.9	44.3	73.6	93.4
S.T.S. Gary	(T <sub>1</sub> ) 29 Jul 1400 - (T <sub>2</sub> ) 1 Aug 0100	20.3	7.2	49.5	205.1	225.4
S.T.S. Helen	(T <sub>1</sub> ) 10 Aug 1700 - (T <sub>2</sub> ) 12 Aug 2000	241.4	146.2	235.2	239.5	480.9
T.S. Irving	(T <sub>1</sub> ) 18 Aug 0800 - (T <sub>2</sub> ) 20 Aug 0800	0.8	4.0	4.0	4.0	4.8
S.T.S. Lois	(T <sub>1</sub> ) 26 Aug 0800 - (T <sub>2</sub> ) 27 Aug 0800	58.8	42.6	52.4	52.8	111.6
T. Kent	(T <sub>1</sub> ) 30 Aug 2100 - (T <sub>2</sub> ) 1 Sep 1000	127.6	15.6	19.3	19.3	146.9
T.S. Nina	(T <sub>1</sub> ) 6 Sep 0000 - (T <sub>2</sub> ) 7 Sep 1800	19.1	0.2	0.2	0.2	19.3
T. Ryan	(T <sub>1</sub> ) 20 Sep 0700 - (T <sub>2</sub> ) 22 Sep 0000	0.4	Nil	Nil	Nil	0.4
T. Sibyl	(T <sub>1</sub> ) 2 Oct 0300 - (T <sub>2</sub> ) 4 Oct 0200	194.1	Trace	191.8	261.2	455.3
T.S. Ted #	(T <sub>1</sub> ) 13 Oct 1400 - (T <sub>2</sub> ) 14 Oct 0200	Trace	5.4	12.5	12.5	12.5
					<b>Total :</b>	<b>1 550.5</b>

N.B. # Tropical cyclones without hoisting of tropical cyclone warning signals.

\* Hour in Hong Kong Time (UTC + 8).

## (b) THE 10 WETTEST TROPICAL CYCLONES IN HONG KONG (1884 - 1939, 1947 -1995)

Tropical Cyclone			Rainfall at the Royal Observatory (mm)				
Year	Month	Name	(i) 600 km	(ii) 24 hours	(iii) 48 hours	(iv) 72 hours	(i)+(iv)
*1926	Jul	-	34.8	534.0	561.1	562.2	597.0
*1916	Jun	-	494.8	27.9	59.4	67.2	562.0
1965	Sep	Agnes	404.6	8.9	64.3	126.1	530.7
1978	Jul	Agnes	502.4	12.3	12.3	16.6	519.0
1976	Aug	Ellen	90.7	394.2	421.0	425.4	516.1
1993	Sep	Dot	459.6	37.9	37.9	37.9	497.5
1982	Aug	Dot	41.2	322.5	403.1	450.5	491.7
1995	Aug	Helen	241.4	146.2	235.2	239.5	480.9
*1904	Aug	-	446.5	Nil	3.7	26.7	473.2
1974	Oct	Carmen	307.6	150.3	161.7	162.1	469.7

N.B. :

(i) during the period in hours when the tropical cyclone was centred within 600 km of Hong Kong.

(ii) during the 24-hour period after the tropical cyclone moved outside (or dissipated within) the 600 km radius.

(iii) during the 48-hour period after the tropical cyclone moved outside (or dissipated within) the 600 km radius.

(iv) during the 72-hour period after the tropical cyclone moved outside (or dissipated within) the 600 km radius.

\* For years prior to 1961, (i) is the sum of daily rainfall on those days when tropical cyclone was centred within 600 km of Hong Kong, (ii) to (iv) are correspondingly the sum of daily rainfall figures of the following days.

TABLE 9. TYPHOONS REQUIRING THE HOISTING OF THE HURRICANE SIGNAL NO. 10 DURING THE PERIOD 1946-1995

Name of typhoon	Date	Nearest approach to Royal Observatory (km)	Minimum M.S.L. pressure (hPa)		Maximum 60-min mean wind in points and km/h							Maximum gust peak speed in km/h with direction in points						
			Hourly	Inst.	Royal Observatory	King's Park	Hong Kong Airport	Waglan Island	Cheung Chau	Tate's Cairn	Green Island	Royal Observatory	King's Park	Hong Kong Airport	Waglan Island	Cheung Chau	Tate's Cairn	Green Island
-	18 Jul 1946	S 70	985.7	-	NE	-	-	-	-	-	-	-	-	-	-	-	-	-
Gloria	22 Sep 1957	SW 55	986.2	984.3	ESE 115	-	ESE 72	E 113	-	-	-	E 187	-	ENE 158	ENE 185	-	-	-
Mary	9 Jun 1960	WNW 10	974.3	973.8	SSE 96	-	SSE 92	SSW 112	-	-	-	SSE 191	-	SE 164	SSW 194	-	-	-
Alice	19 May 1961	0	981.6	981.1	ENE 83	-	E 70	ESE 90	ENE 76	-	-	E 166	-	ENE 139	SW 128	ENE 135	-	-
Wanda	1 Sep 1962	SSW 20	955.1	953.2	N 133	-	N 108	NW 148	NW 118	SE 189	-	N 259	-	N 229	NW 216	NW 232	ESE 284	-
Ruby	5 Sep 1964	SW 30	971.0	968.2	E 110	-	N 118	ENE 148	NE 113	ESE 167	-	NNE 227	-	NW 203	E 230	NNE 216	E 268	-
Dot	13 Oct 1964	E 35	978.9	977.3	NNW 88	-	N 67	N 117	NNW 96	NNE 157	-	N 175	-	N 198	N 184	WNW 205	NE 220	-
Shirley	21 Aug 1968	0	968.7	968.6	N 68	-	N 75	NNE 124	SSW 90	NNE 126	-	N 133	-	N 151	NE 209	SSW 167	NNE 203	-
Rose	17 Aug 1971	WSW 20	984.5	982.8	SE 103	-	SE 122	ESE 140	SE 131	S 148	-	ESE 224	-	ESE 211	ESE 189	SE 194	S 221	-
Elsie	14 Oct 1975	S 50	996.4	996.2	ENE 58	N 75	NNW 67	NNE 118	N 106	NE 130	NNW 118	NE 140	N 137	N 140	ENE 176	NE 158	NNE 180	NE 167
Hope	2 Aug 1979	NNW 10	961.8	961.6	W 75	WNW 79	W 115	SW 144	SSW 117	NW 115	W 108	W 175	WNW 166	WNW 182	SW 198	WSW 185	WNW 229	W 167
Ellen	9 Sep 1983	SW 45	983.9	983.1	E 92	E 88	E 112	ESE 169	ESE 171	E 126	S 137	E 185	E 167	E 203	E 227	SSE 238	ENE 218	S 220*

\* estimated, exceeding upper limit of anemogram.

TABLE 10. DAMAGE CAUSED BY TROPICAL CYCLONES IN HONG KONG IN 1995

Name of tropical cyclone	Month	Damage in physical terms					Damage in monetary terms (million HK\$)					
		Agricultural	Public works facilities	Public utilities	Private property	Landslip & collapse of slope	Agricultural	Public works facilities	Public utilities	Private property	Others	Total
S.T.S. Gary	Jul	-	-	railway : 2 sites	-	17 cases	-	-	-	-	-	-
S.T.S. Helen	Aug	farmland : 246 hectares fruit plants : 2 hectares	road : 1 site	-	11 units	60 cases	4.06	21.73	3.70	-	-	29.49
T. Kent	Aug-Sep	-	-	-	-	3 cases	-	1.41	0.02	-	-	1.43
T.S. Nina	Sep	-	-	-	1 unit	3 cases	-	-	-	-	-	-
T. Sibyl	Oct	farmland : 324 hectares fruit plants : 3 hectares	-	-	2 units	10 cases	5.34	2.67	-	0.08	-	8.09

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.

TABLE 11. CASUALTIES AND DAMAGE CAUSED BY TROPICAL CYCLONES IN HONG KONG : 1966 - 1995

Year	Date	Name of tropical cyclone	Ocean-going vessels in trouble	Small craft sunk or wrecked	Small craft damaged	Persons dead	Persons missing	Persons injured
1966	12 - 14 Jul	S.T.S. Lola	0	*	6	1	0	6
1967	19 - 22 Aug	S.T.S. Kate	3	1	0	0	0	3
1968	17 - 22 Aug	T. Shirley	1	*	3	0	0	4
1969	22 - 29 Jul	T. Viola	0	3	0	0	0	0
1970	1 - 3 Aug	T.D.	0	0	0	2 <sup>+</sup>	0	0
	8 - 14 Sep	T. Georgia	2	0	*	0	0	0
1971	15 - 18 Jun	T. Freda	8	0	0	2	0	30
	16 - 22 Jul	T. Lucy	10	2	13	0	0	38
	10 - 17 Aug	T. Rose	33**	303	*	110	5	286
1972	4 - 9 Nov	T. Pamela	3	0	0	1	0	8
1973	14 - 20 Jul	T. Dot	14	*	*	1	0	38
1974	7 - 14 Jun	T. Dinah	1	*	*	0	0	0
	18 - 22 Jul	T. Ivy	2	*	*	0	0	0
	15 - 19 Oct	T. Carmen	5	*	*	1	0	0
	21 - 27 Oct	T. Della	2	*	*	0	0	0
1975	10 - 14 Aug	T.D.	3	1	*	2	1	0
	9 - 14 Oct	T. Elsie	7	2	1	0	0	46
	16 - 23 Oct	S.T.S. Flossie	1	*	*	0	0	0
1976	22 Jun - 4 Jul	T. Ruby	0	0	0	3	2	2
	21 - 26 Jul	S.T.S. Violet	0	0	0	2	1	1
	5 - 6 Aug	S.T.S. Clara	0	0	0	0	0	4
	21 - 24 Aug	T.S. Ellen	0	4	7	27	3	65
	15 - 21 Sep	T. Iris	6	0	1	0	0	27
1977	4 - 6 Jul	T.D.	0	0	0	0	0	2
	3 - 5 Sep	T.S. Carla	1	0	0	0	0	1
	22 - 25 Sep	S.T.S. Freda	2	0	0	1	0	37
1978	24 - 30 Jul	S.T.S. Agnes	0	25	42	3	0	134
	9 - 12 Aug	T.S. Bonnie	2	0	0	0	0	0
	23 - 28 Aug	S.T.S. Elaine	8	5	8	1	0	51
	22 - 26 Sep	S.T.S. Kit	0	1	0	0	7	0
	7 - 16 Oct	S.T.S. Nina	0	0	0	0	0	2
	17 - 29 Oct	T. Rita	1	5	0	0	0	3
1979	1 - 6 Jul	T. Ellis	0	2	0	0	0	0
	26 - 30 Jul	T.S. Gordon	0	2	0	0	0	0
	28 Jul - 3 Aug	T. Hope	29	167	207	12	0	260
	6 - 9 Aug	T.D.	0	3	0	0	0	0
	16 - 24 Sep	S.T.S. Mac	2	12	0	1	0	67
1980	5 - 12 Jul	S.T.S. Ida	1	0	0	0	0	0
	18 - 23 Jul	T. Joe	4	0	1	2	1	59
	20 - 28 Jul	T. Kim	0	2	1	0	0	0
	29 Oct - 2 Nov	T.S. Cary	0	0	2	0	0	0
1981	3 - 7 Jul	S.T.S. Lynn	0	0	3	0	0	32
1982	27 Jun - 2 Jul	T.S. Tess	0	1	0	0	0	16
	22 - 30 Jul	T. Andy	0	0	1	0	0	0
	5 - 16 Sep	T. Irving	0	0	2	0	0	0

TABLE 11. (cont'd)

Year	Date	Name of tropical cyclone	Ocean-going vessels in trouble	Small craft sunk or wrecked	Small craft damaged	Persons dead	Persons missing	Persons injured
1983	12 - 19 Jul	T. Vera	0	1	0	0	0	0
	29 Aug - 9 Sep	T. Ellen	44	135	225	10	12	333
	10 - 14 Oct	T. Joe	2	0	3	0	0	58
	20 - 26 Oct	S.T.S. Lex	0	0	1	0	0	0
1984	27 Aug - 7 Sep	T. Ike	0	0	0	0	0	1
1985	19 - 25 Jun	T. Hal	0	4	2	0	1	13
	1 - 7 Sep	T. Tess	6	1	3	2	0	12
	13 - 22 Oct	T. Dot	0	0	0	0	0	1
1986	3 - 12 Jul	T. Peggy	3	0	3	1	0	26
	9 - 12 Aug	T.D.	0	1	5	0	0	3
	18 Aug - 6 Sep	T. Wayne	0	3	0	3	1	15 <sup>+</sup>
	11 - 19 Oct	T. Ellen	1	2	1	0	0	4
1987	16 - 27 Oct	T. Lynn	0	0	0	0	0	1
1988	14 - 20 Jul	T. Warren	1	2	1	0	1	12
	19 - 22 Sep	T. Kit	0	0	1	0	0	0
	18 - 23 Oct	T. Pat	0	0	0	2	0	1
	21 - 29 Oct	T. Ruby	0	0	0	0	0	4
1989	16 - 21 May	T. Brenda	0	3	5	6	1	119
	11 - 19 Jul	T. Gordon	1	0	8	2	0	31
	8 - 14 Oct	T. Dan	1	0	1	0	0	0
1990	15 - 19 May	T. Marian	0	0	1	0	0	0
	15 - 19 Jun	S.T.S. Nathan	1	0	2	5	1	1
	21 - 30 Jun	T. Percy	0	0	0	1	0	0
	27 - 31 Jul	S.T.S. Tasha	0	1	0	0	0	1
	25 - 30 Aug	T. Becky	0	0	0	0	1	0
	10 - 20 Sep	T. Ed	0	0	0	0	0	1
1991	15 - 20 Jul	T. Amy	1	0	2	0	0	1
	20 - 24 Jul	S.T.S. Brendan	1	1	13	0	0	17
	13 - 18 Aug	T. Fred	0	1	0	0	0	0
1992	9 - 14 Jul	T. Eli	0	0	1	0	0	23
	17 - 18 Jul	T.S. Faye	1	0	3	2	0	24
	19 - 23 Jul	S.T.S. Gary	2	0	0	0	0	18
1993	21 - 28 Jun	T. Koryn	0	0	2	0	0	183
	16 - 21 Aug	T. Tasha	0	0	7	0	0	35
	9 - 14 Sep	T. Abe	0	0	0	1	0	0
	15 - 17 Sep	S.T.S. Becky	0	0	10	1	0	130
	23 - 27 Sep	T. Dot	0	1	0	0	1	48
	28 Oct - 5 Nov	T. Ira	0	1	0	2	0	30
1994	23 - 25 Jun	T.S. Sharon	0	1	1	0	0	5
	25 - 29 Aug	S.T.S. Harry	0	0	2	1	0	2
1995	7 - 12 Aug	S.T.S. Helen	0	0	0	3	0	35
	25 Aug - 1 Sep	T. Kent	0	0	0	0	0	5
	28 Sep - 4 Oct	T. Sibyl	0	0	0	0	0	14

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.

\*\*Note: Number of Ocean-going vessels in trouble is revised on 30 Jul 2021.

## **Section 5**

# **TROPICAL CYCLONE POSITION AND INTENSITY DATA, 1995**

Six-hourly position and intensity data are tabulated for the following tropical cyclones in 1995 in the western North Pacific and the South China Sea (i.e. the area between the equator and 45°N, and between 100°E and 180°).

Name of tropical cyclone	Page
Tropical Depression of 8 January	77
Tropical Storm Chuck (9501)	78
Tropical Storm Deanna (9502)	79
Tropical Depression Eli	80
Typhoon Faye (9503)	81
Severe Tropical Storm Gary (9504)	82
Severe Tropical Storm Helen (9505)	83
Tropical Storm Irving (9506)	84
Severe Tropical Storm Janis (9507)	85
Typhoon Kent (9508)	86
Severe Tropical Storm Lois (9509)	87
Typhoon Mark (9510)	88
Tropical Storm Nina (9511)	89
Tropical Depression of 9 - 10 September	90
Typhoon Oscar (9512)	91
Typhoon Polly (9513)	92
Typhoon Ryan (9514)	93
Typhoon Sibyl (9515)	94
Tropical Storm Ted (9516)	95
Tropical Storm Val (9517)	96
Typhoon Ward (9518)	97
Severe Tropical Storm Yvette (9519)	98
Typhoon Zack (9521)	99
Typhoon Angela (9520)	100
Tropical Storm Brian (9522)	101
Tropical Depression Colleen	102
Tropical Depression of 3 - 4 December	103
Tropical Depression of 9 -11 December	104
Severe Tropical Storm Dan (9523)	105

Surface winds in this section refer to wind speeds averaged over a period of 10 minutes given in the unit of m/s.  
(Note: 1 m/s is about 2 knots or 4 km/h)

**SIX-HOURLY POSITION AND INTENSITY DATA OF  
THE TROPICAL DEPRESSION OF 8 JANUARY**

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °N	Long. °E
Jan	8	0000	T.D.	1004	13	8.0	175.6
		0600	T.D.	1000	16	8.7	174.8
		1200	T.D.	1004	13	9.3	174.1
		1800	T.D.	1004	13	10.0	173.4

Dissipated

**SIX-HOURLY POSITION AND INTENSITY DATA OF  
TROPICAL STORM CHUCK (9501)**

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °N	Long. °E	
Apr	27	1800	T.D.	1004	13	5.2	166.1	
		28	0000	T.D.	1004	13	5.7	166.4
	0600		T.D.	1004	13	6.3	166.6	
	1200		T.D.	1000	16	6.8	166.5	
	1800		T.D.	1000	16	7.3	166.2	
	29		0000	T.D.	1000	16	7.6	165.6
			0600	T.S.	998	18	7.6	164.8
		1200	T.S.	998	18	7.3	163.9	
	30	1800	T.S.	998	18	7.0	163.1	
		0000	T.S.	998	18	6.7	162.6	
		0600	T.S.	998	18	6.4	162.2	
		1200	T.S.	998	18	6.1	161.9	
		1800	T.D.	1000	16	5.8	161.6	
	May	1	0000	T.D.	1000	16	5.4	161.6
0600			T.D.	1000	16	5.9	161.9	
1200			T.D.	1000	16	6.8	161.7	
1800			T.D.	1000	16	7.8	161.3	
2		0000	T.D.	1000	16	8.8	160.8	

Dissipated

**SIX-HOURLY POSITION AND INTENSITY DATA OF  
TROPICAL STORM DEANNA (9502)**

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °N	Long. °E
Jun	1	0000	T.D.	1002	13	10.0	129.5
		0600	T.D.	1002	13	10.6	128.4
		1200	T.D.	1002	13	11.1	127.3
		1800	T.D.	1002	13	11.6	126.1
	2	0000	T.D.	1002	13	12.0	124.8
		0600	T.D.	1000	16	12.6	123.5
		1200	T.D.	1000	16	13.2	122.3
		1800	T.D.	1000	16	13.6	121.4
	3	0000	T.S.	994	18	13.8	120.6
		0600	T.S.	994	18	14.0	119.7
		1200	T.S.	990	21	14.8	119.2
		1800	T.S.	990	21	15.7	119.0
	4	0000	T.S.	990	21	16.7	119.0
		0600	T.S.	990	21	17.7	119.2
		1200	T.S.	994	18	18.4	119.4
		1800	T.S.	994	18	18.8	119.5
	5	0000	T.S.	994	18	19.1	119.5
		0600	T.S.	994	18	19.3	119.3
		1200	T.S.	994	18	19.2	119.0
		1800	T.S.	994	18	19.0	118.7
	6	0000	T.S.	994	18	18.8	118.5
		0600	T.S.	994	18	18.7	118.2
		1200	T.S.	994	18	18.8	117.9
		1800	T.S.	994	18	19.0	117.7
	7	0000	T.S.	994	18	19.3	117.5
		0600	T.S.	994	18	19.7	117.5
		1200	T.S.	994	18	20.2	117.7
		1800	T.S.	994	18	20.9	118.1
	8	0000	T.D.	996	16	21.8	118.7
		0600	T.D.	996	16	22.9	119.6
		1200	T.D.	996	16	23.7	120.8

Dissipated

**SIX-HOURLY POSITION AND INTENSITY DATA OF  
TROPICAL DEPRESSION ELI**

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °N	Long. °E	
Jun	4	0600	T.D.	1002	16	12.9	144.6	
		1200	T.D.	1002	16	13.0	143.3	
		1800	T.D.	1002	16	13.3	142.0	
	5	0000	T.D.	1002	16	13.8	140.8	
		0600	T.D.	1002	16	14.6	139.7	
		1200	T.D.	1002	16	15.5	138.7	
	6	1800	T.D.	1002	16	16.5	138.0	
		0000	T.D.	1002	16	17.3	137.5	
		0600	T.D.	1002	16	17.9	137.2	
	7	1200	T.D.	1002	16	18.4	137.0	
		1800	T.D.	1002	16	18.7	136.9	
		0000	T.D.	1002	16	19.0	136.9	
	8	0600	T.D.	1002	16	19.3	136.9	
		1200	T.D.	1002	16	19.6	136.9	
		1800	T.D.	1002	16	20.0	136.9	
	8	0000	T.D.	1002	16	20.6	137.0	
		0600	T.D.	1006	13	21.2	137.2	
		1200	T.D.	1006	13	21.9	137.5	
			1800	T.D.	1006	13	23.0	138.0

Dissipated

**SIX-HOURLY POSITION AND INTENSITY DATA OF  
TYPHOON FAYE (9503)**

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °N	Long. °E
Jul	17	1200	T.D.	1002	13	18.4	139.8
		1800	T.D.	1000	16	18.6	139.3
	18	0000	T.S.	996	18	18.7	138.7
		0600	T.S.	996	18	18.8	138.1
		1200	T.S.	992	21	19.0	137.4
		1800	T.S.	990	23	19.3	136.5
	19	0000	T.S.	990	23	19.7	135.5
		0600	T.S.	990	23	20.2	134.6
		1200	S.T.S.	985	25	20.6	133.6
		1800	S.T.S.	980	28	21.1	132.5
	20	0000	S.T.S.	980	28	21.5	131.5
		0600	S.T.S.	980	28	22.1	130.5
		1200	S.T.S.	980	28	22.9	129.5
		1800	S.T.S.	975	31	23.6	128.6
	21	0000	S.T.S.	975	31	24.3	127.8
		0600	S.T.S.	975	31	24.9	127.2
		1200	T.	970	33	25.5	126.7
		1800	T.	965	36	26.6	126.4
	22	0000	T.	960	39	27.0	126.2
		0600	T.	955	41	28.0	126.5
		1200	T.	955	41	29.1	127.1
		1800	T.	955	41	30.6	127.6
	23	0000	T.	965	36	32.3	127.8
		0600	T.	970	33	34.2	127.9
		1200	S.T.S.	980	28	36.0	128.4
		1800	T.S.	985	23	37.6	129.6
	24	0000	T.S.	990	21	39.2	131.0
		0600	T.S.	994	18	40.4	133.2
		1200	T.D.	998	16	41.3	136.0

Became Extratropical

**SIX-HOURLY POSITION AND INTENSITY DATA OF  
SEVERE TROPICAL STORM GARY (9504)**

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °N	Long. °E
Jul	27	0600	T.D.	1000	13	15.8	122.5
		1200	T.D.	1000	13	16.3	121.9
		1800	T.D.	996	16	16.9	121.3
	28	0000	T.D.	996	16	17.7	120.5
		0600	T.D.	996	16	18.2	119.9
		1200	T.D.	996	16	18.4	119.4
	29	1800	T.D.	996	16	18.6	118.9
		0000	T.D.	996	16	18.7	118.4
		0600	T.S.	994	18	18.8	118.0
	30	1200	T.S.	992	21	18.9	117.7
		1800	T.S.	992	21	19.1	117.5
		0000	T.S.	992	21	19.3	117.3
	31	0600	S.T.S.	985	25	19.6	117.2
		1200	S.T.S.	985	25	20.0	117.1
		1800	S.T.S.	980	28	21.1	117.1
	31	0000	S.T.S.	980	28	22.5	117.0
		0600	S.T.S.	985	25	24.1	116.9
		1200	T.S.	990	21	25.6	116.8
		1800	T.D.	996	16	27.0	116.0

**Dissipated**

**SIX-HOURLY POSITION AND INTENSITY DATA OF  
SEVERE TROPICAL STORM HELEN (9505)**

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °N	Long. °E	
Aug	7	0600	T.D.	1005	13	14.3	132.0	
		1200	T.D.	1005	13	14.3	131.1	
		1800	T.D.	1005	13	14.6	130.2	
	8	0000	T.D.	1005	13	15.2	129.4	
		0600	T.D.	1005	13	16.0	128.3	
		1200	T.D.	1005	13	17.2	127.0	
	9	1800	T.D.	1000	16	18.4	125.6	
		0000	T.S.	998	18	19.1	123.7	
		0600	T.S.	996	21	19.4	121.8	
	10	1200	T.S.	996	21	19.1	120.2	
		1800	T.S.	996	21	18.8	119.0	
		0000	T.S.	990	23	18.2	118.0	
	11	0600	T.S.	990	23	17.8	117.0	
		1200	T.S.	990	23	17.9	116.2	
		1800	T.S.	990	23	18.4	115.8	
	12	0000	S.T.S.	985	25	19.1	115.5	
		0600	S.T.S.	980	28	19.9	115.3	
		1200	S.T.S.	980	28	20.8	115.0	
		12	1800	S.T.S.	980	28	21.6	114.8
			0000	S.T.S.	980	28	22.5	114.6
			0600	S.T.S.	985	25	23.3	114.5
		1200	T.S.	995	21	24.1	114.5	

**Dissipated**

**SIX-HOURLY POSITION AND INTENSITY DATA OF  
TROPICAL STORM IRVING (9506)**

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °N	Long. °E	
Aug	17	0600	T.D.	1002	16	15.8	112.5	
		1200	T.D.	1002	16	16.3	112.3	
		1800	T.D.	1002	16	16.8	112.1	
	18	0000	T.S.	998	18	17.6	112.0	
		0600	T.S.	996	21	18.4	112.0	
		1200	T.S.	996	21	19.0	112.0	
		1800	T.S.	996	21	19.4	111.8	
		19	0000	T.S.	996	21	19.8	111.4
			0600	T.S.	996	21	20.2	111.0
	1200		T.S.	998	18	20.6	110.6	
	20	1800	T.D.	1000	16	20.9	110.2	
		0000	T.D.	1000	16	21.3	109.7	

**Dissipated**

**SIX-HOURLY POSITION AND INTENSITY DATA OF  
SEVERE TROPICAL STORM JANIS (9507)**

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °N	Long. °E
Aug	21	1200	T.D.	1000	16	19.9	130.1
		1800	T.S.	998	18	20.1	130.3
	22	0000	T.S.	994	21	20.4	130.4
		0600	T.S.	994	21	21.0	130.2
		1200	T.S.	994	18	21.7	129.6
		1800	T.S.	994	18	22.8	128.4
	23	0000	T.S.	994	18	23.8	126.9
		0600	T.S.	994	18	24.7	125.6
		1200	T.S.	994	18	25.4	124.7
		1800	T.S.	994	21	25.9	124.1
	24	0000	T.S.	990	23	26.3	123.6
		0600	T.S.	990	23	26.8	123.1
		1200	S.T.S.	985	25	27.3	122.6
		1800	T.S.	990	23	27.9	122.0
	25	0000	T.S.	992	21	28.7	121.3
		0600	T.S.	994	18	29.7	121.0
		1200	T.S.	994	18	31.0	121.2
		1800	T.S.	994	18	32.4	121.7
	26	0000	T.S.	994	18	34.0	122.6

**Became Extratropical**

**SIX-HOURLY POSITION AND INTENSITY DATA OF  
TYPHOON KENT (9508)**

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °N	Long. °E
Aug	25	1200	T.D.	1005	13	13.2	130.0
		1800	T.D.	1005	13	14.2	128.8
	26	0000	T.D.	1000	16	14.9	128.0
		0600	T.D.	1000	16	15.5	127.3
		1200	T.S.	998	18	16.0	126.9
	27	1800	T.S.	992	21	16.3	126.6
		0000	T.S.	990	23	16.6	126.5
		0600	T.S.	990	23	16.9	126.4
		1200	S.T.S.	985	25	17.2	126.3
		1800	S.T.S.	985	25	17.5	126.2
		28	0000	S.T.S.	980	28	17.8
	0600		S.T.S.	975	31	18.0	125.9
	1200		S.T.S.	975	31	18.1	125.7
	1800		S.T.S.	975	31	18.2	125.4
	29		0000	T.	970	33	18.5
		0600	T.	965	36	18.7	124.6
		1200	T.	960	39	19.0	124.1
		1800	T.	955	41	19.5	123.3
	30	0000	T.	950	43	20.1	122.3
		0600	T.	950	43	20.6	121.0
		1200	T.	950	43	21.1	119.7
1800		T.	950	43	21.7	118.3	
31	0000	T.	955	41	22.3	116.9	
	0600	T.	960	39	22.7	115.3	
	1200	S.T.S.	975	31	23.2	113.5	
Sep	1	1800	T.S.	992	21	23.8	111.7
		0000	T.D.	998	16	24.2	109.9

**Dissipated**

**SIX-HOURLY POSITION AND INTENSITY DATA OF  
SEVERE TROPICAL STORM LOIS (9509)**

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °N	Long. °E
Aug	26	0000	T.D.	998	16	17.5	115.0
		0600	T.D.	998	16	17.5	114.3
		1200	T.S.	992	18	17.5	113.6
		1800	T.S.	990	21	17.5	112.9
	27	0000	T.S.	985	23	17.5	112.4
		0600	S.T.S.	980	25	17.5	111.9
		1200	S.T.S.	980	25	17.6	111.3
		1800	S.T.S.	975	28	18.0	110.9
	28	0000	S.T.S.	970	31	18.4	110.3
		0600	S.T.S.	975	28	18.6	109.6
		1200	S.T.S.	975	28	18.8	108.9
		1800	S.T.S.	975	28	19.0	108.2
	29	0000	S.T.S.	975	28	19.1	107.5
		0600	S.T.S.	975	28	19.2	106.9
		1200	S.T.S.	975	28	19.3	106.3
		1800	S.T.S.	980	25	19.2	105.5
	30	0000	T.S.	990	21	19.1	104.7
		0600	T.D.	994	16	18.8	104.0

**Dissipated**

**SIX-HOURLY POSITION AND INTENSITY DATA OF  
TYPHOON MARK (9510)**

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °N	Long. °E
Aug	30	0000	T.D.	1006	13	28.3	152.1
		0600	T.D.	1002	16	29.0	153.0
		1200	T.D.	1002	16	29.5	153.9
		1800	T.S.	998	18	30.0	154.6
	31	0000	T.S.	990	23	30.5	155.3
		0600	S.T.S.	985	25	31.0	156.0
		1200	S.T.S.	985	25	31.6	156.7
		1800	S.T.S.	980	28	32.2	157.5
Sep	1	0000	T.	975	33	33.2	158.8
		0600	T.	970	36	34.8	160.8
		1200	T.	970	36	36.4	163.2
		1800	S.T.S.	980	31	37.8	166.4
	2	0000	T.S.	990	23	39.2	169.6
		0600	T.S.	998	18	40.5	172.7

Became Extratropical

**SIX-HOURLY POSITION AND INTENSITY DATA OF  
TROPICAL STORM NINA (9511)**

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °N	Long. °E
Sep	2	1200	T.D.	1004	13	11.5	129.4
		1800	T.D.	1004	13	12.5	128.1
	3	0000	T.D.	1000	16	13.4	127.0
		0600	T.D.	1000	16	14.5	126.0
		1200	T.D.	1000	16	15.6	125.0
		1800	T.D.	1000	16	16.5	123.3
	4	0000	T.D.	1000	16	16.9	121.3
		0600	T.D.	1000	16	17.1	119.3
		1200	T.D.	1000	16	17.1	118.1
		1800	T.D.	1000	16	17.1	117.3
	5	0000	T.D.	1000	16	17.1	116.7
		0600	T.S.	996	18	17.1	116.1
		1200	T.S.	996	18	17.2	115.6
		1800	T.S.	996	18	17.4	115.0
	6	0000	T.S.	996	18	17.7	114.4
		0600	T.S.	996	18	18.1	113.6
		1200	T.S.	996	18	18.7	112.8
		1800	T.S.	992	21	19.5	111.9
	7	0000	T.S.	994	18	20.5	110.9
		0600	T.S.	994	18	21.6	109.8
		1200	T.D.	998	16	23.0	108.4

Dissipated

**SIX-HOURLY POSITION AND INTENSITY DATA OF  
THE TROPICAL DEPRESSION OF 9 - 10 SEPTEMBER**

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °N	Long. °E
Sep	9	0600	T.D.	1005	13	13.3	113.5
		1200	T.D.	1005	13	13.2	113.0
		1800	T.D.	1005	13	13.1	112.5
	10	0000	T.D.	1005	13	13.2	111.8
		0600	T.D.	1005	13	13.4	110.8
		1200	T.D.	1005	13	13.8	109.9
		1800	T.D.	1005	13	14.5	109.5

**Dissipated**

**SIX-HOURLY POSITION AND INTENSITY DATA OF  
TYPHOON OSCAR (9512)**

Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °N	Long. °E
11	1800	T.D.	1004	13	14.6	148.2
12	0000	T.D.	1004	13	15.3	147.7
	0600	T.D.	1000	16	16.0	147.1
	1200	T.D.	1000	16	16.7	146.7
	1800	T.S.	996	18	17.3	146.2
13	0000	T.S.	992	21	17.9	145.7
	0600	T.S.	990	23	18.7	144.9
	1200	S.T.S.	985	25	19.3	143.7
	1800	S.T.S.	975	31	19.8	142.4
14	0000	T.	970	33	20.3	141.1
	0600	T.	965	36	20.9	140.1
	1200	T.	955	41	21.5	139.3
	1800	T.	950	43	22.3	138.6
15	0000	T.	945	46	23.1	138.0
	0600	T.	935	51	24.0	137.4
	1200	T.	925	57	24.9	136.9
	1800	T.	920	59	25.9	136.6
16	0000	T.	920	59	27.0	136.5
	0600	T.	920	59	28.2	136.6
	1200	T.	925	57	29.5	137.3
	1800	T.	930	54	31.1	138.3
17	0000	T.	935	49	33.2	139.9
	0600	T.	950	41	36.3	142.8
	1200	T.	965	33	40.0	146.3

**Became Extratropical**

**SIX-HOURLY POSITION AND INTENSITY DATA OF  
TYPHOON POLLY (9513)**

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °N	Long. °E
Sep	14	1800	T.D.	1000	16	17.0	123.6
		15	0000	T.D.	1000	16	17.1
	0600		T.D.	1000	16	17.3	124.5
	1200		T.D.	1000	16	17.5	125.3
	1800		T.D.	1000	16	17.7	126.2
	16		0000	T.S.	996	18	18.0
		0600	T.S.	996	18	18.5	129.4
		1200	T.S.	996	18	19.0	131.2
		1800	T.S.	992	21	19.2	133.1
	17	0000	T.S.	992	21	19.2	135.0
		0600	T.S.	990	23	19.3	136.7
		1200	S.T.S.	985	25	19.8	137.7
	18	1800	S.T.S.	980	28	20.4	137.8
		0000	S.T.S.	975	31	21.2	137.8
		0600	T.	970	33	22.0	137.8
		1200	T.	970	33	23.0	137.8
	19	1800	T.	965	36	24.0	137.8
		0000	T.	965	36	24.9	138.0
		0600	T.	965	36	25.6	138.8
		1200	T.	960	39	26.5	140.0
	20	1800	T.	960	39	27.7	141.2
		0000	T.	960	39	28.8	142.4
		0600	T.	960	39	29.8	143.8
		1200	T.	965	36	30.7	145.5
21	1800	T.	970	33	31.9	147.6	
	0000	T.	970	33	33.3	149.7	
	0600	T.	970	33	34.7	152.0	
	1200	S.T.S.	980	28	36.5	155.4	
		1800	T.S.	990	23	39.0	159.3

**Became Extratropical**

**SIX-HOURLY POSITION AND INTENSITY DATA OF  
TYPHOON RYAN (9514)**

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °N	Long. °E
Sep	16	0600	T.D.	998	16	13.7	114.3
		1200	T.S.	994	18	14.3	114.3
		1800	T.S.	994	18	14.0	114.2
	17	0000	T.S.	994	18	14.0	114.6
		0600	T.S.	994	18	14.3	114.6
		1200	T.S.	994	18	14.6	114.6
	18	1800	T.S.	990	21	14.7	114.4
		0000	T.S.	985	23	14.7	114.0
		0600	S.T.S.	980	28	14.7	113.5
	19	1200	S.T.S.	980	28	14.7	113.1
		1800	S.T.S.	980	28	14.9	112.7
		0000	S.T.S.	980	28	15.2	112.5
	20	0600	S.T.S.	975	31	15.6	112.5
		1200	T.	970	33	16.3	112.5
		1800	T.	965	36	17.0	112.5
	21	0000	T.	960	39	17.6	112.6
		0600	T.	955	41	17.9	113.1
		1200	T.	945	43	18.3	113.9
	22	1800	T.	945	43	18.7	115.0
		0000	T.	945	43	19.2	116.2
		0600	T.	945	43	19.7	117.4
	23	1200	T.	945	43	20.3	118.6
		1800	T.	945	43	20.9	119.7
		0000	T.	950	41	21.6	120.9
	24	0600	T.	950	41	22.4	122.2
		1200	T.	950	41	23.6	123.5
		1800	T.	955	39	24.9	124.8
	25	0000	T.	960	36	26.5	126.0
		0600	T.	965	33	28.5	127.5
		1200	S.T.S.	970	31	30.6	129.2
26	1800	S.T.S.	980	28	33.3	131.3	
	0000	T.S.	990	23	36.9	134.3	

Became Extratropical

**SIX-HOURLY POSITION AND INTENSITY DATA OF  
TYPHOON SIBYL (9515)**

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °N	Long. °E	
Sep	28	0600	T.D.	1000	16	8.8	130.0	
		1200	T.D.	1000	16	9.4	129.0	
		1800	T.S.	996	18	10.3	128.1	
	29	0000	T.S.	990	23	11.0	127.2	
		0600	T.S.	990	23	11.5	126.1	
		1200	T.S.	990	23	12.0	125.1	
		1800	T.S.	990	23	12.5	124.1	
		30	0000	S.T.S.	985	25	12.9	123.1
			0600	S.T.S.	980	28	13.2	122.0
	1200		S.T.S.	980	28	13.8	121.5	
	Oct	1	1800	S.T.S.	985	25	14.7	121.0
			0000	S.T.S.	985	25	15.6	119.8
0600			S.T.S.	985	25	16.3	118.4	
1200			S.T.S.	980	28	16.8	117.1	
1800			S.T.S.	980	28	17.3	116.0	
2		0000	S.T.S.	980	28	17.9	115.0	
		0600	T.	970	33	18.5	114.0	
		1200	T.	970	33	19.3	113.1	
		1800	T.	970	33	20.0	112.4	
		3	0000	T.	970	33	20.8	111.9
0600			S.T.S.	985	25	21.8	111.2	
1200			T.S.	995	18	22.8	110.6	
1800			T.D.	1000	13	23.5	110.3	

**Dissipated**

**SIX-HOURLY POSITION AND INTENSITY DATA OF  
TROPICAL STORM TED (9516)**

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °N	Long. °E
Oct	9	0000	T.D.	1004	13	15.0	116.8
		0600	T.D.	1004	13	14.9	114.9
		1200	T.D.	1004	13	14.8	113.4
		1800	T.D.	1004	13	14.9	112.4
	10	0000	T.D.	1000	16	15.1	111.7
		0600	T.D.	1000	16	15.4	111.2
		1200	T.D.	1000	16	15.7	110.6
		1800	T.D.	1000	16	16.1	110.1
	11	0000	T.D.	1000	16	16.4	109.6
		0600	T.D.	1000	16	16.7	109.1
		1200	T.S.	998	18	17.1	108.7
		1800	T.S.	998	18	17.5	108.3
	12	0000	T.S.	994	21	18.0	108.1
		0600	T.S.	994	21	18.5	108.1
		1200	T.S.	990	23	19.0	108.1
		1800	T.S.	990	23	19.6	108.2
	13	0000	T.S.	994	21	20.5	108.4
		0600	T.S.	994	21	21.4	108.7
		1200	T.S.	998	18	22.2	109.3
		1800	T.D.	1000	16	23.0	110.5

**Dissipated**

**SIX-HOURLY POSITION AND INTENSITY DATA OF  
TROPICAL STORM VAL (9517)**

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °N	Long. °E
Oct	10	0000	T.D.	1004	13	21.8	144.2
		0600	T.D.	1004	13	22.7	143.1
		1200	T.D.	1004	13	23.8	141.6
		1800	T.D.	1004	13	24.7	140.0
	11	0000	T.D.	1000	16	25.3	139.0
		0600	T.S.	998	18	26.0	138.2
		1200	T.S.	990	23	26.7	137.9
		1800	T.S.	992	21	27.2	138.0
	12	0000	T.S.	992	21	27.6	138.4
		0600	T.S.	992	21	27.7	138.9
		1200	T.S.	996	18	27.0	139.0
		1800	T.S.	996	18	26.2	138.9
	13	0000	T.S.	996	18	25.4	138.8
		0600	T.S.	996	18	24.8	138.7
		1200	T.D.	1000	16	24.2	138.6

**Dissipated**

**SIX-HOURLY POSITION AND INTENSITY DATA OF  
TYPHOON WARD (9518)**

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °N	Long. °E
Oct	16	1200	T.D.	1004	13	13.0	152.2
		1800	T.D.	1004	13	13.4	150.4
	17	0000	T.D.	1000	16	13.7	148.6
		0600	T.S.	998	18	14.1	146.9
		1200	T.S.	994	21	14.5	145.3
		1800	S.T.S.	985	25	14.9	143.7
		0000	S.T.S.	975	31	15.4	142.1
	18	0600	T.	970	33	16.0	140.6
		1200	T.	965	36	16.7	139.2
		1800	T.	960	39	17.6	137.8
		0000	T.	955	41	18.6	136.5
		0600	T.	950	43	19.7	135.5
		1200	T.	945	46	20.9	134.7
	19	1800	T.	945	46	21.8	134.3
		0000	T.	945	46	22.7	134.1
		0600	T.	945	46	23.6	134.2
		1200	T.	950	43	24.4	134.6
	20	1800	T.	955	41	25.1	135.1
		0000	T.	960	39	25.8	135.8
		0600	T.	965	36	26.6	136.6
		1200	T.	970	33	27.6	137.8
		1800	S.T.S.	975	31	28.8	139.5
	21	0000	S.T.S.	980	28	30.1	141.6
		0600	S.T.S.	985	25	31.0	144.0
		1200	S.T.S.	985	25	31.0	144.0

Became Extratropical

**SIX-HOURLY POSITION AND INTENSITY DATA OF  
SEVERE TROPICAL STORM YVETTE (9519)**

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °N	Long. °E	
Oct	22	1800	T.D.	1005	13	10.5	130.0	
		23	0000	T.D.	1005	13	11.5	128.0
	23	0600	T.D.	1000	16	12.3	126.2	
		1200	T.D.	1000	16	12.8	124.6	
		1800	T.D.	1000	16	13.2	123.0	
		0000	T.D.	1000	16	13.4	121.5	
		0600	T.D.	1000	16	13.4	120.0	
		1200	T.D.	1000	16	13.4	118.8	
	24	1800	T.S.	998	18	13.4	117.4	
		0000	T.S.	994	21	13.4	115.6	
		0600	T.S.	994	21	13.4	113.8	
		1200	T.S.	994	21	13.4	112.4	
	25	1800	T.S.	990	23	13.4	111.0	
		0000	S.T.S.	985	25	13.4	109.7	
		0600	T.S.	994	21	13.4	108.4	
		1200	T.D.	1000	16	13.4	107.0	
		26	1800	T.D.	1004	13	13.5	105.7

**Dissipated**

**SIX-HOURLY POSITION AND INTENSITY DATA OF  
TYPHOON ZACK (9521)**

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °N	Long. °E	
Oct	25	0000	T.D.	1005	13	8.0	138.6	
		0600	T.D.	1005	13	8.6	137.7	
		1200	T.D.	1000	16	9.0	136.7	
		1800	T.D.	1000	16	9.0	135.7	
	26	0000	T.D.	1000	16	8.9	134.8	
		0600	T.D.	1000	16	8.9	133.9	
		1200	T.D.	1000	16	9.0	133.0	
		1800	T.D.	1000	16	9.3	132.2	
	27	0000	T.S.	996	18	9.8	131.2	
		0600	T.S.	992	21	10.2	129.8	
		1200	T.S.	990	23	10.3	128.3	
		1800	S.T.S.	985	25	10.4	127.0	
	28	0000	S.T.S.	980	28	10.5	125.7	
		0600	S.T.S.	980	28	10.7	124.3	
		1200	S.T.S.	980	28	10.8	123.0	
		1800	S.T.S.	980	28	11.1	121.7	
	29	0000	S.T.S.	980	28	11.3	120.5	
		0600	S.T.S.	980	28	11.4	119.3	
		1200	S.T.S.	975	31	11.5	118.1	
		1800	S.T.S.	975	31	11.8	117.2	
	30	0000	S.T.S.	975	31	12.3	116.4	
		0600	T.	970	33	13.1	115.6	
		1200	T.	965	36	13.9	114.8	
		1800	T.	965	36	14.5	114.0	
	31	0000	T.	960	39	14.7	113.1	
		0600	T.	955	41	14.7	112.3	
		1200	T.	955	41	14.8	111.6	
		1800	T.	960	39	14.8	110.6	
	Nov	1	0000	T.	965	36	14.8	109.6
			0600	S.T.S.	975	31	14.8	108.4
1200			T.S.	990	23	14.5	106.4	
1800			T.D.	1000	16	14.2	105.2	

**Dissipated**

**SIX-HOURLY POSITION AND INTENSITY DATA OF  
TYPHOON ANGELA (9520)**

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °N	Long. °E	
Oct	25	1200	T.D.	1004	13	10.2	148.2	
		1800	T.D.	1004	13	10.2	146.7	
	26	0000	T.D.	1000	16	10.2	145.5	
		0600	T.D.	1000	16	10.5	144.4	
	27	1200	T.D.	1000	16	11.0	143.5	
		1800	T.S.	996	18	11.6	142.7	
		0000	T.S.	992	21	12.0	141.9	
		0600	T.S.	990	23	12.3	141.3	
		1200	T.S.	990	23	12.6	140.6	
		1800	T.S.	990	23	12.9	139.8	
	28	0000	T.S.	990	23	13.1	139.0	
		0600	T.S.	990	23	13.2	138.4	
		1200	T.S.	990	23	13.2	138.0	
	29	1800	S.T.S.	985	25	12.9	138.0	
		0000	S.T.S.	980	28	12.8	138.3	
		0600	S.T.S.	980	28	12.6	138.2	
		1200	S.T.S.	980	28	12.5	137.8	
	30	1800	S.T.S.	980	28	12.5	137.3	
		0000	S.T.S.	975	31	12.3	136.7	
		0600	S.T.S.	975	31	12.0	136.0	
	31	1200	S.T.S.	975	31	11.9	135.3	
		1800	S.T.S.	975	31	11.8	134.6	
		0000	T.	970	33	12.0	133.6	
		0600	T.	965	36	12.2	132.5	
		1200	T.	960	39	12.3	131.3	
		1800	T.	955	41	12.4	130.2	
	Nov	1	0000	T.	945	46	12.7	129.7
			0600	T.	930	54	13.3	128.9
			1200	T.	930	54	14.1	128.1
		2	1800	T.	930	54	14.3	126.9
0000			T.	935	51	14.2	126.0	
0600			T.	935	51	14.2	125.1	
3		1200	T.	935	51	14.2	124.2	
		1800	T.	945	46	14.2	123.2	
		0000	T.	955	41	14.3	122.0	
4		0600	T.	960	39	14.5	120.6	
		1200	T.	970	33	14.7	119.0	
		1800	T.	970	33	14.7	118.0	
5	0000	T.	970	33	14.7	117.0		
	0600	S.T.S.	975	31	14.9	116.0		
	1200	S.T.S.	975	31	15.1	114.9		
	1800	S.T.S.	975	31	15.4	113.8		
	0000	S.T.S.	975	31	15.8	112.7		
	0600	S.T.S.	975	31	16.2	111.8		
6	1200	S.T.S.	980	28	16.7	111.1		
	1800	T.S.	990	23	17.1	110.4		
	0000	T.S.	992	21	17.5	110.0		
	0600	T.S.	996	18	17.9	109.5		
		1200	T.D.	1000	16	18.5	109.1	

Dissipated

**SIX-HOURLY POSITION AND INTENSITY DATA OF  
TROPICAL STORM BRIAN (9522)**

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °N	Long. °E
Nov	1	0000	T.D.	1006	13	18.8	156.8
		0600	T.D.	1006	13	19.5	155.1
		1200	T.D.	1006	13	20.3	153.5
		1800	T.D.	1006	13	21.4	152.2
	2	0000	T.D.	1000	16	22.9	151.3
		0600	T.D.	1000	16	24.3	151.0
		1200	T.S.	998	18	25.8	151.8
		1800	T.S.	996	21	27.2	153.2
	3	0000	T.S.	996	21	28.7	155.1
		0600	T.S.	998	18	30.3	157.7
		1200	T.D.	1000	16	31.8	160.8

**Dissipated**

**SIX-HOURLY POSITION AND INTENSITY DATA OF  
TROPICAL DEPRESSION COLLEEN**

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °N	Long. °E
Nov	11	1200	T.D.	1000	16	20.2	180.0
		1800	T.D.	1000	16	19.0	179.6
	12	0000	T.D.	1000	16	17.9	179.0
		0600	T.D.	1000	16	16.9	178.3
		1200	T.D.	1005	13	16.4	177.2
		1800	T.D.	1005	13	16.7	176.0

**Dissipated**

**SIX-HOURLY POSITION AND INTENSITY DATA OF  
THE TROPICAL DEPRESSION OF 3 - 4 DECEMBER**

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °N	Long. °E
Dec	3	0000	T.D.	1004	13	14.5	126.2
		0600	T.D.	1004	13	14.4	125.7
		1200	T.D.	1004	13	14.2	125.3
		1800	T.D.	1004	13	14.1	125.0
	4	0000	T.D.	1004	13	13.9	124.7
		0600	T.D.	1004	13	13.6	124.4
		1200	T.D.	1004	13	13.4	124.1

**Dissipated**

**SIX-HOURLY POSITION AND INTENSITY DATA OF  
THE TROPICAL DEPRESSION OF 9 - 11 DECEMBER**

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °N
Dec	9	1200	T.D.	1002	16	8.9
		1800	T.D.	1002	16	8.6
	10	0000	T.D.	1002	16	8.5
		0600	T.D.	1002	16	8.5
		1200	T.D.	1002	16	8.5
		1800	T.D.	1002	16	8.5
		0000	T.D.	1002	16	8.5
	11	0600	T.D.	1002	16	8.5

**Dissipated**

**SIX-HOURLY POSITION AND INTENSITY DATA OF  
SEVERE TROPICAL STORM DAN (9523)**

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °N	Long. °E
Dec	25	0600	T.D.	1000	16	8.1	134.2
		1200	T.D.	1000	16	8.4	133.2
		1800	T.D.	1000	16	8.7	132.2
	26	0000	T.S.	998	18	9.0	131.2
		0600	T.S.	998	18	9.3	130.4
		1200	T.S.	998	18	9.5	129.7
		1800	T.S.	998	18	9.7	129.2
	27	0000	T.S.	994	21	9.9	128.7
		0600	T.S.	990	23	10.1	128.2
		1200	T.S.	990	23	10.2	127.8
		1800	T.S.	990	23	10.4	127.4
	28	0000	T.S.	990	23	10.6	127.2
		0600	S.T.S.	985	25	10.9	127.0
		1200	S.T.S.	985	25	11.4	127.0
		1800	S.T.S.	980	28	12.0	127.3
	29	0000	S.T.S.	980	28	12.6	127.7
		0600	S.T.S.	980	28	13.2	128.2
		1200	S.T.S.	980	28	13.9	128.9
		1800	S.T.S.	980	28	14.8	129.7
	30	0000	S.T.S.	980	28	16.0	130.9
		0600	S.T.S.	980	28	17.3	132.3
1200		S.T.S.	985	25	18.9	134.7	
1800		T.S.	990	23	20.6	138.0	
31	0000	T.S.	996	18	22.5	141.8	

Became Extratropical