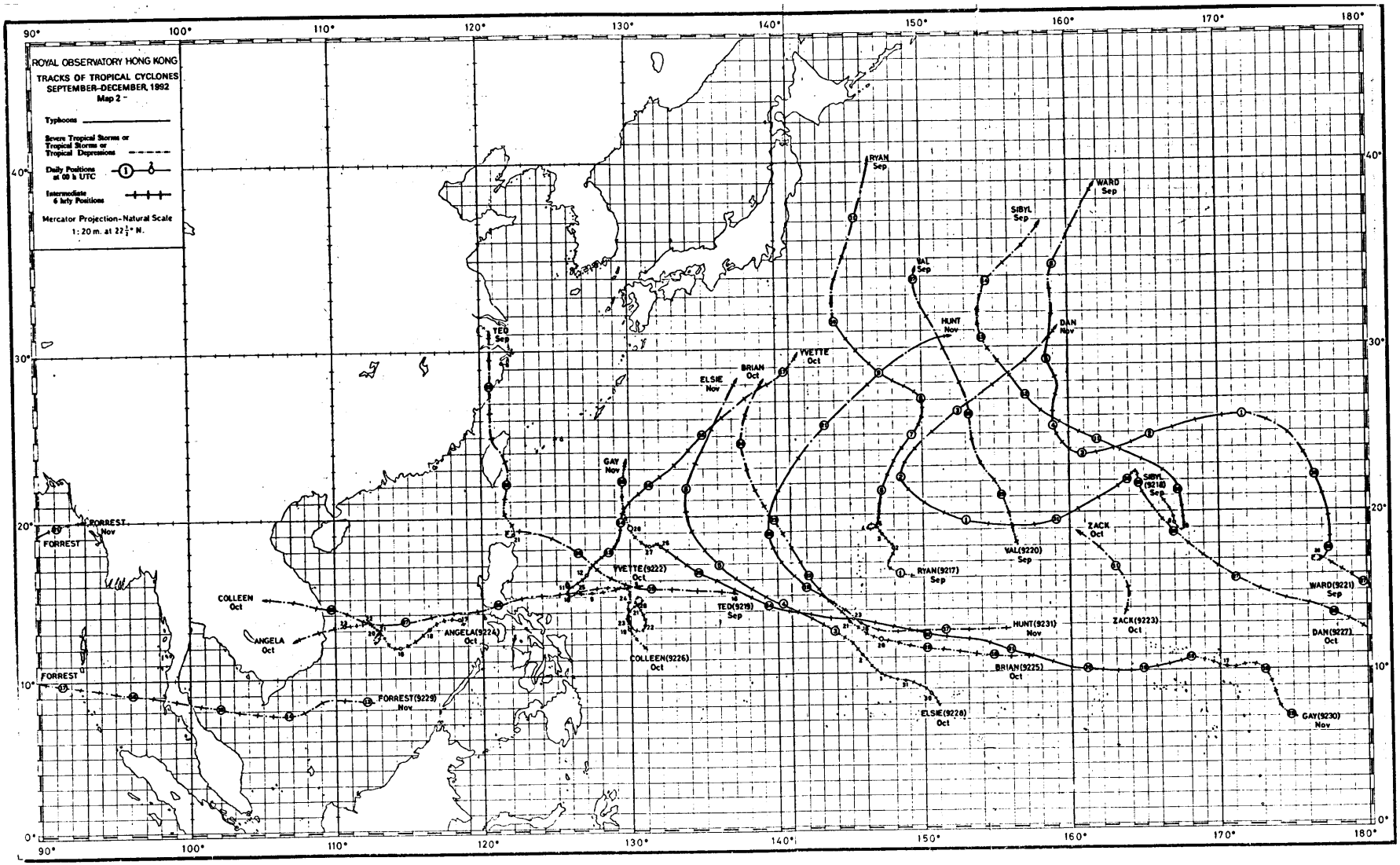
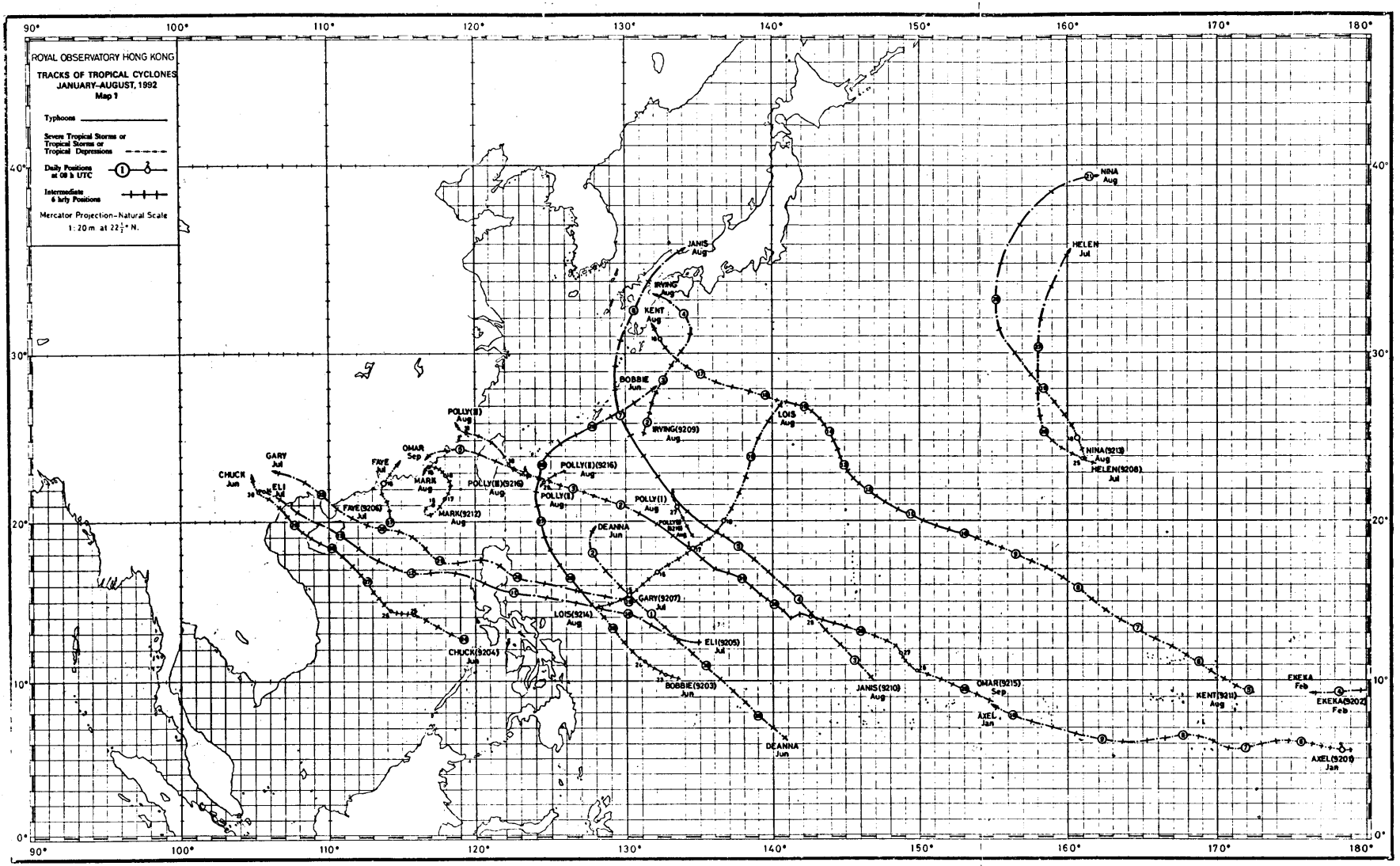

ROYAL OBSERVATORY HONG KONG
TRACKS OF TROPICAL CYCLONES
SEPTEMBER-DECEMBER, 1992
Map 2
Typhoons
Severe Tropical Storms or Tropical Storms or Tropical Depressions
Daily Positions at 00 h UTC
Intermediate 6 hrly Positions
Mercator Projection - Natural Scale
1: 20 m. at 22½° N.
90°
100°
110°
120°
130°
140°
150°
160°
170°
180°
40°
30°
20°
10°
0°
RYAN Sep
WARD Sep
SIBYL Sep
VAL Sep
HUNT Nov
DAN Nov
TED Sep
WYETTE Oct
ELSIE Nov
BRIAN Oct
GAY Nov
FORREST Nov
FORREST
SIBYL (9218) Sep
ZACK Oct
VAL(9220) Sep
RYAN(9217) Sep
WYETTE(9222) Oct
WARD(9221) Sep
COLLEEN Oct
TED(9219) Sep
HUNT(9231) Nov
ZACK(9223) Oct
ANGELA Oct
ANGELA(9224) Oct
DAN(9227) Oct
COLLEEN(9226) Oct
BRIAN(9225) Oct
FORREST
FORREST(9229) Nov
ELSIE(9228) Oct
GAY(9230) Nov


ROYAL OBSERVATORY HONG KONG
TRACKS OF TROPICAL CYCLONES
JANUARY–AUGUST, 1992
Map 1
Typhoons
Severe Tropical Storms or Tropical Storms or Tropical Depressions
Daily Positions at 08 h UTC
Intermediate 6 hrly Positions
Mercator Projection–Natural Scale
1:20m at 22½° N.
90°
100°
110°
120°
130°
140°
150°
160°
170°
180°
40°
30°
20°
10°
0°
NINA Aug
HELEN Jul
JANIS Aug
IRVING Aug
KENT Aug
BOBBIE Jun
IRVING(9209) Aug
LOIS Aug
POLLY(II) Aug
OMAR Sep
GARY Jul
CHUCK Jun
ELI Jul
FAYE Jul
MARK Aug
POLLY(II)(9216) Aug
POLLY(II)(9216) Aug
POLLY(I) Aug
NINA(9213) Aug
HELEN(9208) Jul
FAYE(9206) Jul
MARK(9212) Aug
DEANNA Jun
GARY(9207) Jul
LOIS(9214) Aug
ELI(9205) Jul
CHUCK(9204) Jun
BOBBIE(9203) Jun
JANIS(9210) Aug
OMAR(9215) Sep
AXEL Jan
KENT(9211) Aug
EKEKA Feb
EKEKA(9202) Feb
AXEL(9201) Jan
DEANNA Jun

ROYAL OBSERVATORY HONG KONG

TROPICAL CYCLONES IN 1992

Published September 1994

Prepared by
Royal Observatory
134A Nathan Road
Kowloon
Hong Kong

This publication is available from:

Government Publications Centre
General Post Office Building
Ground Floor
Connaught Place
Hong Kong

551.515.2:551.506.1 (512.317)

CONTENTS

FIGURES

TABLES

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. The publication of Meteorological Results Part II was terminated in 1981. Upper-air data are now archived on magnetic tapes. Starting from 1987, Part I was re-titled as 'Surface Observations in Hong Kong' but the format and contents remained unchanged.

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 fourth tropical cyclone of tropical storm intensity or above which occurred within the region in 1992 was assigned the code '9204'. In this publication, the appropriate code immediately follows the name of the tropical cyclone in bracket, e.g. Typhoon Chuck (9204)

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	
Royal Observatory	22°18′	114°10′	74
Central (Star Ferry Pier)	22°17′	114°10′	17
Cheung Chau	22°12′	114°01′	92
Green Island	22°17′	114°07′	105
Hong Kong Airport (NW)	22°19′	114°12′	14
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
Sai Kung	22°23′	114°16′	41
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 Mo Shan	22°25′	114°07′	969
Tai Po Kau	22°27′	114°11′	28
Tate's Cairn	22°22′	114°13′	588
Tseung Kwan O	22°19′	114°15′	52
Tsing Yi (Mobil Oil Depot)	22°21′	114°06′	18
Tuen Mun	22°24′	113°58′	68
Waglan Island	22°11′	114°18′	82
Wong Chuk Hang	22°15′	114°10′	30

Wind reports were also provided by Hong Kong International Terminal Ltd. at Kwai Chung. Maximum storm surges caused by tropical cyclones were measured by tide gauges installed at several locations around Hong Kong. The locations of these anemometers and tide gauges 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 1992 is presented.

The reports in Section 3 are individual accounts of the life history of tropical cyclones affecting Hong Kong in 1992. 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.

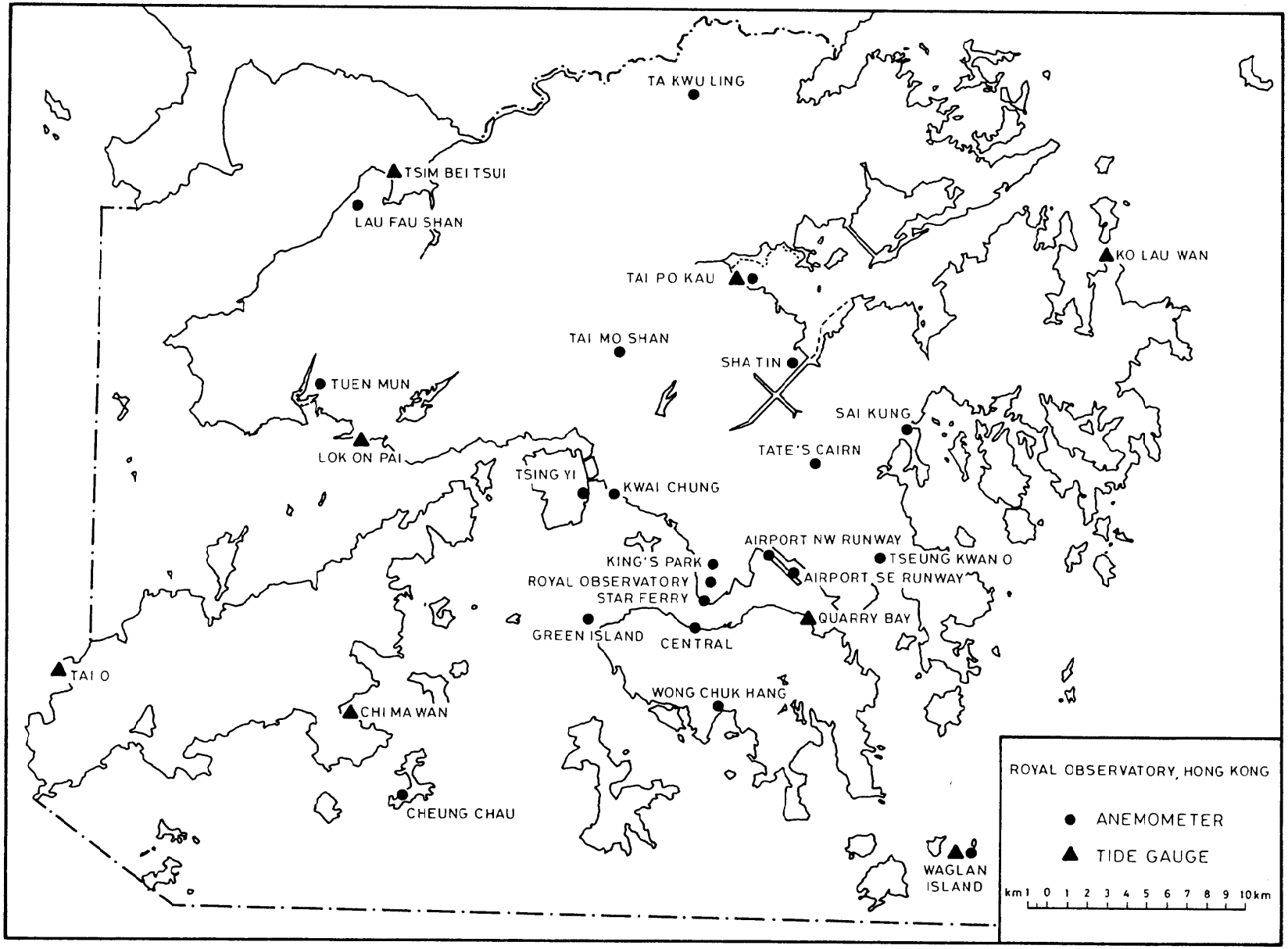


Figure 1. Locations of anemometers and tide gauge stations in Hong Kong.

Section 2

TROPICAL CYCLONE OVERVIEW FOR 1992

In 1992, there were 32* 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, 1992 was a year with near-normal tropical cyclone activity. However, the number of tropical cyclones attaining typhoon intensity was slightly above normal-a total of 18 typhoons in 1992 against the 30-year annual average of 15.6. The monthly distribution of the frequency of first occurrence of tropical cyclones and that of typhoons for 1992 are shown in Figure 2. The monthly mean frequency of these two parameters during the years 1961-1990 are shown in Figure 3.

Gay (9230) was the most intense typhoon in 1992 while Polly (9216) the most destructive. Ted (9219) was another vicious storm which affected the Philippines and China in September. The passages of Gary (9207) across the Philippines in July and Angela (9224) through Vietnam in October both led to heavy casualties while Janis (9210) turned out to be a very costly typhoon for Japan.

Along the coast of China, the preferred landfall locations shifted from Hainan Island and southwestern China in July to Taiwan and eastern China in September. Western Japan, in particular Kyushu, was hit by three tropical cyclones in August. Although the Philippines appeared to have had a relatively quiet year with only three tropical cyclones passing through, much damage was inflicted by Ted (9219) on northern Philippines. In the late season, Vietnam, Cambodia and Thailand were all visited by tropical cyclones.

During the year, 11 tropical cyclones occurred within the area of responsibility of Hong Kong (i.e. the area bounded by l0°N, 30°N, 105°E and 125°E). This number was lower than the 30-year (1961-90) annual average of 16.4. Of the 11 tropical cyclones, four developed within Hong Kong's area of responsibility. Altogether, 330 tropical cyclone warnings to ships and vessels were issued by the Royal Observatory in 1992 (Table 2).

Local warning signals were hoisted in Hong Kong for five tropical cyclones. The Strong Wind Signal No. 3 was the highest signal required for Typhoon Chuck (9204), Typhoon Eli (9205) and Tropical Storm Faye (9206) while the Gale or Storm Signal No. 8 was necessitated for Severe Tropical Storm Gary (9207).

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 1992 amounted to 321.6 mm, 57 per cent below the mean annual value of 741.0 mm (1961-1990). It accounted for 12 per cent of the year's total rainfall of 2678.8 mm. Apart from Chuck, all other tropical cyclones that necessitated the hoisting of tropical cyclone warning signals came within 600 km of Hong Kong. In addition, a tropical cyclone named Omar (9215) was within 600 km of Hong Kong during its dissipating stage. Rainfall figures associated with these tropical cyclones are given in Table 8(a).

The following is a review of all the tropical cyclones in 1992.

The first tropical cyclone in 1992 originated from an area of disturbance over the western North Pacific near the International Date Line. It developed into Tropical Depression Axel (9201) about 3000 km east of Truk Island on 5 January. Moving westwards at about 12 km/h, Axel intensified to a tropical storm later that day and became a severe tropical storm on 6 January. The next day, Axel weakened to a tropical storm, but re-intensified to a severe tropical storm early on 9 January. Tracking west-northwestwards at about 27 km/h, Axel weakened rapidly to a tropical storm about 790 km east of Truk Island. It degenerated to an area of low pressure over water on 10 January.

There was only one tropical cyclone over the western North Pacific in February. Ekeka (9202) formed over the central North Pacific. It crossed the International Date Line and entered the western North Pacific as a tropical depression on 4 February. Moving westwards towards the Marshall Islands with a speed of about 27 km/h, Ekeka weakened gradually and dissipated over water on the same day.

After a lull lasting over four months, active tropical cyclone development took place over the western North Pacific and the South China Sea during the last week of June when three disturbances (Bobbie (9203), Chuck (9204) and Deanna) developed in quick succession.

Bobbie formed as a tropical depression about 1 430 km east-southeast of Manila on the evening of 22 June. It intensified to a tropical storm the next evening and accelerated northwestwards. On 25 June, Bobbie intensified further and attained typhoon intensity about 730 km east of Manila. It recurved towards the north on the night of 26 June. Peak intensity was reached early the next morning when the maximum sustained winds and the minimum sea-level pressure near the centre of Bobbie were estimated to be 155 km/h and 950 hPa respectively. Bobbie turned northeastwards on 28 June and passed about 40 km south-southeast of Okinawa the following day. In Okinawa, transportation was severely disrupted and schools were forced to close. Bobbie weakened to a severe tropical storm about 140 km east-northeast of Okinawa while accelerating on a northeastward track. It became extra-tropical on 30 June.

Two days after the formation of Bobbie, Chuck (9204) developed over the South China Sea. It traversed the South China Sea, crossed Hainan Island and Beibu Wan before making landfall over Vietnam. Chuck necessitated the hoisting of tropical cyclone warning signals in Hong Kong. A detailed report on Typhoon Chuck is presented in Section 3.

* including Tropical Storm Ekeka (9202) which formed over the central North Pacific and moved across the International Date Line into the western North Pacific.

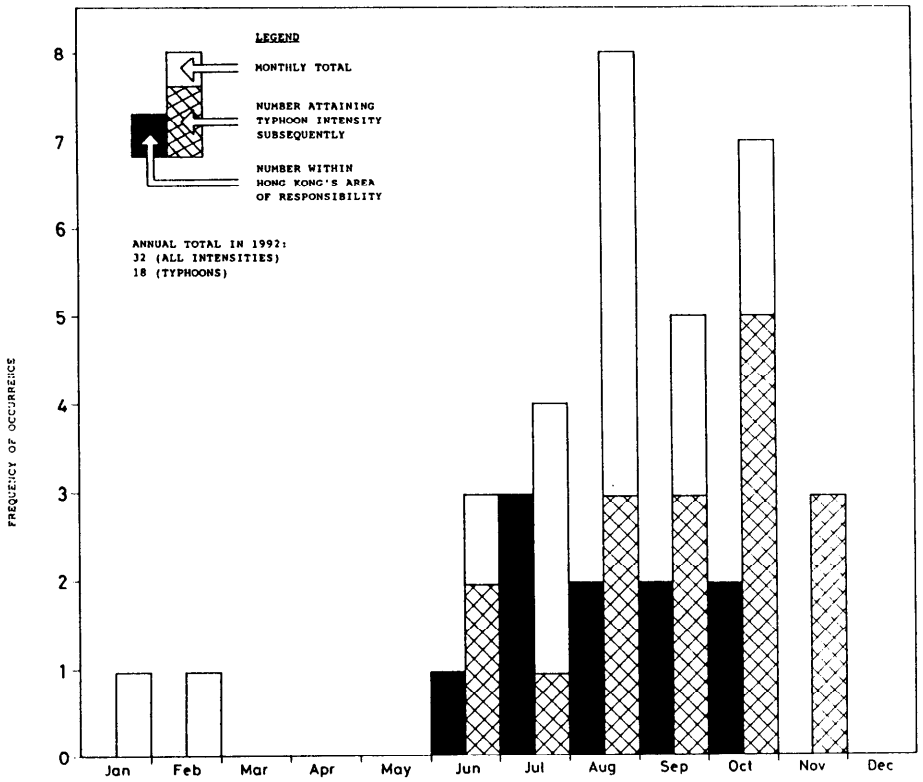


Figure 2. Monthly distributions of the frequency of first occurrence of tropical cyclones in the western North Pacific and the South China Sea in 1992

Figure 2. Monthly distribution of the frequency of first occurrence of tropical cyclones in the western North Pacific and the South China Sea in 1992

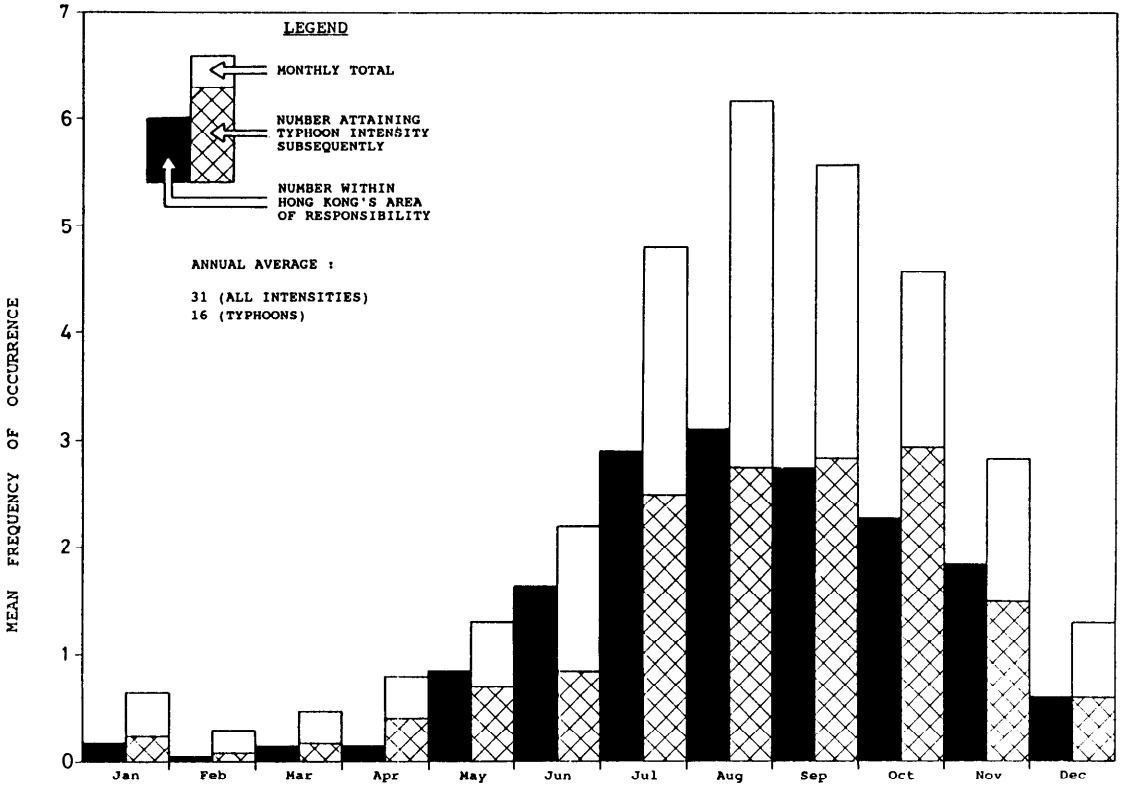


Figure 3. Monthly distributions of the mean frequency of first occurrence of tropical cyclones in the western North Pacific and the South China Sea, 1961-1990.

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.

The third tropical cyclone in June was Tropical Depression Deanna. It formed about 440 km southeast of Yap on 28 June and moved northwestwards at 22 km/h. Deanna was poorly organized during its lifetime and degenerated into an area of low pressure while recurving towards the north-northeast on 2 July.

Three tropical cyclones affected the South China Sea in quick succession during July. Eli (9205) hit Hainan Island and landed over northern Vietnam, Faye (9206) brought torrential rain to Hong Kong and Gary (9207) wreaked widespread havoc in southwestern China. All three tropical cyclones necessitated the hoisting of tropical cyclone warning signals in Hong Kong. Detailed reports on Typhoon Eli, Tropical Storm Faye and Severe Tropical Storm Gary are presented in Section 3.

The fourth tropical cyclone to form in July was Helen (9208). It started as a tropical depression about 2 080 km east of Iwo Jima on 25 July. Moving northwestwards at 13 km/h, it rapidly intensified to a severe tropical storm about 1 730 km east of Iwo Jima the next day. Helen then accelerated northwards and weakened to a tropical storm. Moving north-northeastwards at a speed of 38 km/h on 27 July, it weakened further to a tropical depression about 1 770 km east of Tokyo, and became extra-tropical soon afterwards.

Eight tropical cyclones formed over the western North Pacific and the South China Sea in August. Irving (9209), Janis (9210) and Kent (9211) hit Japan while Mark (9212) and Polly (9216) landed in southeast China. Omar (9215) affected Taiwan and Fujian in early September.

Irving formed as a tropical depression about 350 km east-southeast of Okinawa early on 2 August. Moving north-northeastwards at 12 km/h, it intensified to a tropical storm that afternoon. Irving turned northeastwards and became a severe tropical storm the next day. It weakened to a tropical storm early on 4 August while adopting a northwestward track. Weakening further to a tropical depression a few hours later, Irving finally dissipated over southern Japan. Heavy rain associated with Irving interrupted air and rail services in Kyushu.

A tropical disturbance developed into Tropical Depression Janis about 410 km south-southeast of Guam early on 3 August. It moved northwestwards steadily at 25 km/h and became a tropical storm about 140 km west-southwest of Guam that night. Janis strengthened into a severe tropical storm on the night of 4 August and attained typhoon intensity about 940 km northwest of Guam the next morning. On the night of 6 August, Janis reached peak intensity with estimated maximum sustained winds of 165 km/h and minimum sea-level pressure of 940 hPa near its centre. After rampaging across the Ryukyu Islands on 7 August, Janis turned north-northeastwards and weakened to a severe tropical storm about 120 km southwest of Kagoshima early on 8 August. It made landfall over Kyushu a few hours later. Janis became extra-tropical that night after skirting the southwestern coast of Honshu.

In the Ryukyus, flights to and from Okinawa were cancelled during the close approach of Janis. In Kyushu, two people were killed and 41 others were injured. Heavy rain brought on by Janis also caused landslides and flooding there. About 14 houses were destroyed and several others were flooded. Flights and railway services were suspended and the electricity supply to several cities was interrupted.

While Janis was making its way towards the Ryukyu Islands, Kent developed as a tropical depression on 5 August about 1 230 km south-southeast of Wake Island. Moving west-northwestwards at about 19 km/h, Kent became a tropical storm early on 6 August. That night, it intensified and reached severe tropical storm strength. It weakened briefly to a tropical storm the next day but re-intensified into a severe tropical storm on 9 August as it moved west-northwestwards. Kent became a typhoon about 1 340 km west of Wake Island the following day and attained peak intensity on 12 August when the maximum sustained winds and the minimum sea-level pressure near its centre were estimated to be 160 km/h and 945 hPa respectively. After moving north-northwestwards at 10 km/h for about three days, Kent turned west-northwestwards at 12 km/h and passed close to the Ogasawara Islands on 15 August. Early the next day, it weakened to a severe tropical storm about 1 040 km east-southeast of Kagoshima. On 18 August, Kent degenerated into an area of low pressure over the coastal waters off eastern Kyushu.

In southern and western Japan, five people were swept away by waves and two others were reported missing due to the passage of Kent.

Tropical Depression Lois (9214) formed about 770 km east of Manila on 14 August. It was poorly organized during its lifetime and dissipated near the Ogasawara Islands on 20 August.

Mark formed over the northeastern part of the South China Sea on 16 August and subsequently made landfall near Shantou. It necessitated the hoisting of a tropical cyclone warning signal in Hong Kong. A detailed report is presented in Section 3.

On the evening of 17 August when Kent was making its way towards southern Japan, Lois traversed northeastwards across the western north Pacific and Mark headed for the south China coast. Meanwhile, Tropical Depression Nina (9213) formed over the western North Pacific about 2 020 km east of Iwo Jima. Moving north-northwestwards at 10 km/h and intensifying, Nina became a tropical storm the next day. It weakened to a tropical depression about 1 740 km east-northeast of Iwo Jima on 19 August, but temporarily re-gaining tropical storm strength on the afternoon of 20 August. Nina evolved into an extra-tropical cyclone on 21 August.

Omar formed over the Caroline Islands about 1 190 km east-southeast of Guam on 24 August and moved west-northwestwards at about 16 km/h. Gathering strength over water, it attained typhoon intensity about 20 km east-southeast of Guam on 28 August. That evening, Omar swept past Guam causing widespread damage. Peak intensity was reached on 29 August when maximum sustained winds and minimum sea-level pressure near it centre were estimated to be 175 km/h and 935 hPa respectively. Omar weakened to a severe tropical storm about

970 km east of Gaoxiong on 2 September. After sweeping across Taiwan on 4 September, Omar weakened to a tropical storm and made landfall near Xiamen the next day. Over land, Omar degenerated rapidly to a tropical depression and then into an area of low pressure later that day.

In Guam, the fury of Omar killed one person and injured over 100 people. About 5 000 people were made homeless. Several houses were demolished and power lines were brought down. In addition, electricity and water supplies were cut off. The total damage was estimated at over US$l00 million.

In Taiwan, Omar claimed two lives and left 12 injured. More than US$65 million worth of damage was left in its wake. Electricity supply to over 766 000 households was cut. Flooding occurred in five counties. In the harbour of Gaoxiong, four ships ran aground.

Omar's remnant also brought disturbed weather to the South China coastal areas. In Hong Kong, localised heavy rain led to extensive flooding in the northwestern part of the territory on 7 September.

Polly, the last tropical cyclone to form in August, developed as a tropical depression on 26 August. After a series of dissipation and re-generation, Tropical Depression Polly gained better structure and began to move northwestwards towards Taiwan on 29 August. It intensified to a tropical storm about 220 km south-southeast of Taibei early the next day. Later that day, Polly swept across northern Taiwan and traversed the Taiwan Strait. It made landfall near Fuzhou on the morning of 31 August. Polly then weakened rapidly to an area of low pressure and drifted northwards to affect eastern China.

The outer rainbands of Polly affected the Philippines. Swept along by the rain from Polly, volcanic debris from Mount Pinatubo rushed downslope and buried 500 houses in two villages. Five people were killed, several were injured and thousands of people had to flee their homes. In Taiwan, eight people were killed and three were injured. Thousands of houses were inundated and at least 500 hectares of farmland were destroyed. Electricity supply to about 24000 households was also cut. The total agricultural and property loss on the island was estimated at US$72.6 million. In Fujian and Zhejiang, 165 people were killed, 535 were seriously injured and more than 5 000 000 people were made homeless. The economic loss in the two provinces was estimated at 2 400 million RMB. In Shandong, the remnant of Polly killed 24 people. Oil-field production in the province was also disrupted.

Five tropical cyclones formed over the western North Pacific in September 1992, but none affected the South China Sea. Three of them attained typhoon intensity.

Ryan (9217) started as a tropical depression about 550 km east-northeast of Guam early on 1 September. Generally tracking northwards slowly, Ryan gathered strength over the next two days. On the evening of 3 September, Ryan intensified to a typhoon about 660 km north-northeast of Guam. After making an anti-clockwise loop on 4 and 5 September, Ryan accelerated north-northeastwards. On 6 September, peak intensity was reached. The maximum sustained winds and the minimum sea-level pressure near its centre were estimated to be 160 km/h and 940 hPa respectively. Two days later, Ryan took on a northwestward course with a speed of 14 km/h. On 10 September, Ryan turned north-northeastwards and weakened to a severe tropical storm about 530 km southeast of Tokyo. It became extra-tropical the following day.

Tropical Depression Sibyl (9218) formed about 150 km north of Wake Island on 7 September. It initially moved south-southeastwards at a speed of 12 km/h. Slowing down the next day, Sibyl intensified to a severe tropical storm and made a sharp turn towards the north. On the morning of 9 September, typhoon intensity was attained when Sibyl was about 110 km east-southeast of Wake Island. Sibyl accelerated to 27 km/h on 10 September and tracked west-northwestwards. At its peak intensity on the night of 11 September, the maximum sustained winds and minimum sea-level pressure near its centre were estimated to be 160 km/h and 945 hPa respectively. Sibyl weakened to a severe tropical storm about 1 440 km east-northeast of Iwo Jima early on 13 September and started to recurve northeastwards that night. Two days later, Sibyl evolved into an extra-tropical cyclone.

Originating from an area of low pressure east of the Mariana Islands, Ted (9219) developed into a tropical depression about 860 km west-northwest of Guam on 18 September and moved westwards at 15 km/h. It deepened to a tropical storm early the next day and headed towards the Luzon Strait. Tracking over the coastal waters of northern Luzon, Ted became a severe tropical storm in the early morning of 21 September. It temporarily weakened to a tropical storm that night after making a loop, but intensified again to a severe tropical storm the next morning. Ted then tracked northwards and hit the east coast of Taiwan on 22 September. Remaining on a northward track after crossing Taiwan, Ted made landfall over mainland China on the morning of 23 September. It weakened to a tropical storm near Wenzhou and became extra-tropical in the vicinity of Shanghai later that day.

The torrential rain associated with Ted brought flooding and landslides to the northern Philippines, Taiwan and eastern China. In the northern Philippines, at least eight people were killed. A total of 104 houses was demolished. In eastern China, at least 53 people were killed and 51 others were reported missing, with most of the casualties occurring in Zhejiang. About 31 700 houses collapsed, 90 000 hectares of farmland were inundated and 333 000 hectares of paddy field in Jiangsu were affected. The total loss was estimated at 2.3 billion RMB.

As Ted dissipated, Val (9220) formed over the Pacific as a tropical depression about 1 340 km east-northeast of Guam on 24 September. It moved north-northwestwards at about 16 km/h and became a tropical storm about 1 320 km east of Iwo Jima the following night. Val evolved into an extra-tropical cyclone as it picked up speed and moved into higher latitudes on 27 September.

Out in the central North Pacific, Tropical Storm Ward (9221) crossed the International Date Line on 27 September. It moved northwestwards and intensified to a severe tropical storm about 1 130 km east-southeast of Wake Island on 28 September. After completing an anti-clockwise loop, Ward attained typhoon intensity and began moving northwards at about 13 km/h the next day. Ward temporarily weakened to a severe tropical storm on 30 September, but re-gained typhoon intensity the following day while heading westwards at 25 km/h. Peak intensity was reached on 2 October when maximum sustained winds and minimum sea-level pressure near its centre were estimated to be 150 km/h and 950 hPa respectively. On 3 October, Ward started to recurve northwards into higher latitudes. After weakening to a severe tropical storm about 1 780 km east of Tokyo early on 6 October, it accelerated north-northeastwards and became extra-tropical.

Yvette (9222) formed as a tropical depression on the morning of 8 October about 1 030 km east of Manila and moved westwards at about 13 km/h. It intensified rapidly to a severe tropical storm about 690 km east of Manila the next morning. Yvette became slow moving as it attained typhoon intensity on 10 October. After completing an anti-clockwise loop on 11 August, Yvette moved towards the northeast, maintaining its intensity as a typhoon for the next six days. At its peak intensity, maximum sustained winds and minimum sea-level pressure near its centre were estimated to be 165 km/h and 940 hPa respectively. Yvette weakened to a severe tropical storm on 16 October while moving northeastwards at a speed of 34 km/h. Yvette became extra-tropical soon after passing over the northwest of the Ogasawara Islands on 17 October.

While Yvette was making a loop over the Pacific, another disturbance developed into Tropical Depression Zack (9223) about 690 km south-southwest of Wake Island on 10 October. It moved north-northeastwards at 25 km/h initially but later turned to the northwest. Zack was short-lived and it dissipated over the western North Pacific the next day.

Over the South China Sea, Angela (9224) formed as a tropical depression about 290 km west-southwest of Manila in the early morning of 17 October. Tracking along a winding path in the general direction of Vietnam, Angela intensified progressively to a tropical storm later that day and to a severe tropical storm on 18 October. It then attained typhoon strength with peak intensity that afternoon. The maximum sustained winds and the minimum sea-level pressure near its centre were estimated to be 120 km/h and 965 hPa respectively. Angela weakened to a severe tropical storm when it was about 190 km north-northeast of Nansha on 19 October and briefly to a tropical storm in the early morning of 20 October but re-intensified quickly into a severe tropical storm later that day. On completing an anti-clockwise looping motion on 21 October, Angela again weakened to a tropical storm. The following day, Angela intensified to a severe tropical storm for the fourth time and headed west-southwestwards slowly. It weakened to a tropical storm again about 330 km northeast of Ho Chi Minh City on the evening of 23 October, shortly after making landfall over Vietnam. Angela dissipated over land early the next morning.

Angela inflicted significant damage upon Vietnam and Cambodia. In Vietnam, flash floods triggered by Angela killed 47 people. About 17 people were injured while seven other were reported missing. Thousands of hectares of crops were destroyed. Other losses included several houses, hundreds of fishing vessels, and tens of thousands of livestock. Railways and roads were also damaged. In Thailand, two people were killed as a result of inclement weather brought on by Angela. Seven people were reported missing after their boat capsized. About 600 houses were swept away by flood waters.

Soon after the formation of Angela over the South China Sea. Brian (9225) formed as a tropical depression about 1 380 km east-southeast of Guam on 17 October. Moving westwards at about 20 km/h, it deepened to a tropical storm about 860 km east-southeast of Guam the following night. Turning northwestwards, Brian intensified further to a severe tropical storm early on 21 October and hit Guam later that day. Four people were injured and power and water supplies were disrupted on parts of the island. Brian attained typhoon intensity about 290 km northwest of Guam early on 22 October and reached peak intensity a few hours later with maximum sustained winds and minimum sea-level pressure near its centre estimated to be 140 km/h and 960 hPa respectively. Brian gradually lost strength as it continued to move northwestwards. On the morning of 24 October, it became a tropical storm about 400 km west-southwest of Iwo Jima. Moving quickly at 38 km/h, Brian weakened further to a tropical depression on the night of 24 October and dissipated over water eventually.

With Angela to the west and Brian to the east, Colleen (9226) developed as a tropical depression over the western North Pacific on the night of 18 October about 820 km west-northwest of Yap. It intensified to a tropical storm the next morning and underwent a 'figure-8' loop. In the process, it gathered strength and became a severe tropical storm on 21 October. Completing the looping motion, Colleen weakened to a tropical storm as it began to head northwards on 23 October. It weakened to a tropical depression early next morning, picked up speed and turned towards the west. Moving at 19 km/h, Colleen re-intensified to a tropical storm on 25 October. The next day, Colleen lashed the Philippines where one woman was drowned in floods and roads near Baguio were blocked by landslides. After crossing the Philippines, Colleen moved along a generally westward track across the South China Sea. It attained typhoon strength with peak intensity on the morning of 27 October. The maximum sustained winds of 120 km/h and the minimum sea-level pressure of 965 hPa were estimated near its centre. Colleen made landfall over Vietnam about 190 km south-southeast of Danang one day after and degenerated into an area of low pressure.

Dan (9227) also originated over the central North Pacific. After intensifying to a tropical storm, Dan moved west-northwestwards at 22 km/h and crossed the International Date Line on 25 October. It became a severe

tropical storm about 820 km southeast of Wake Island and accelerated to 31 km/h on 27 October. Dan attained typhoon intensity about 160 km northwest of Wake Island on the night of 28 October after passing close to the island earlier that day. Dan turned southwestwards later on 29 October. It attained peak intensity on 1 November with maximum sustained winds and minimum sea-level pressure near its centre estimated to be 165 km/h and 940 hPa respectively. Dan began to lose strength as it recurved northeastwards on 2 November. It weakened to a severe tropical storm about 1 580 km southeast of Tokyo on the morning of 3 November and to a tropical storm that afternoon. Dan weakened further to a tropical depression later that evening and dissipated over water shortly afterwards.

Elsie (9228) developed as a tropical depression about 930 km southeast of Guam on 29 October. Moving northwestwards at 6 km/h, it deepened to a tropical storm the next day. Elsie intensified to a severe tropical storm on the night of 31 October when it was about 520 km southeast of Guam. Weakening briefly to a tropical storm early on 1 November, Elsie intensified again into a severe tropical storm that night. After passing about 140 km south-southwest of Guam early on 3 November, Elsie intensified further to a typhoon the next day. It reached peak intensity on 5 November with maximum sustained winds near it centre estimated to be about 165 km/h. The minimum sea-level pressure was about 940 hPa. Elsie recurved north-northeastwards on 6 November. Moving rapidly at 54 km/h, it weakened to a severe tropical storm about 900 km south-southwest of Tokyo early on 7 November and became extra-tropical.

Forrest (9229) originated from a westward travelling disturbance and developed into a tropical depression about 650 km east-southeast of Ho Chi Minh City on 13 November. Tracking westwards at 22 km/h, it became a tropical storm about 650 km south-southeast of Bangkok on the morning of 15 November. Forrest entered the Andaman Sea after crossing the isthmus of southern Thailand that afternoon. After weakening to a tropical depression about 650 km south-southwest of Bangkok, Forrest re-intensified to a typhoon over the Bay of Bengal on 18 November. Forrest attained peak intensity on 19 November when the maximum sustained winds and minimum sea-level pressure near its centre were estimated to be 150 km/h and 950 hPa respectively. Recurving eastwards towards Burma on 21 November, Forrest weakened rapidly and dissipated over water.

In Vietnam, an aircraft with 31 people on board was reported missing within the circulation of Forrest on 14 November. In Thailand, two people were killed and more than 10 000 people were evacuated. The influence of Forrest also extended to Bangladesh where two people were killed and 50 others were injured. Hundreds of houses were destroyed. Over 400 000 people near the coast had to flee to safety.

During the time when Forrest was moving from the Gulf of Thailand to the Andaman Sea, two tropical cyclones formed in quick succession over the western North Pacific. Gay (9230) formed as a tropical depression about 380 km east of Majuro on 15 November and Hunt (9231) did the same further to the west a day after.

After formation, Gay moved north-northwestwards at a steady speed of 16 km/h. It deepened to a tropical storm on the night of 15 November and turned westwards the next day. Gay intensified to a severe tropical storm on 17 November and to a typhoon some 24 hours later when it was about 530 km northwest of Majuro. At peak intensity on 20 November, the maximum sustained winds near its centre were estimated to be 185 km/h. The minimum sea-level pressure was as low as 925 hPa. Gay skirted past Guam on 23 November and turned northwestwards two days later. On 28 November, Gay weakened to a severe tropical storm about 880 km south-southeast of Okinawa and began to take on a northward course. Moving closer to Okinawa the next day, Gay weakened further to a tropical storm. It dissipated as an area of low pressure soon afterwards.

The passage of Gay over the Marshall Islands left one woman dead and 5 000 people homeless. In Guam, all aircraft and vessel movements ceased in Gay's fury. All other activities on the island also came to a standstill.

Tropical Depression Hunt formed about 1 180 km east of Guam on 16 November. It intensified to a tropical storm about 900 km east of Guam early the next day and became a severe tropical storm that night. Turning to the northwest on 18 November, Hunt skirted past Guam and attained typhoon intensity when it was about 150 km northwest of the island. Peak intensity was reached when Hunt was about to recurve towards the northeast on 20 November. The maximum sustained winds and minimum sea-level pressure near its centre were estimated to be 150 km/h and 950 hPa respectively. Moving into the higher latitudes, Hunt weakened rapidly and became extra-tropical on 21 November.

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

Section 3

REPORTS ON TROPICAL CYCLONES AFFECTING HONG KONG IN 1992

(a) Typhoon Chuck (9204)

24-30 June 1992

The track of Chuck is shown in Figure 4

An area of disturbed weather over the western North Pacific weakened while traversing the Philippines on 22 June. After entering the South China Sea the next day, the system re-organized and became the first tropical cyclone to affect the South China Sea in 1992.

The disturbance developed into Tropical Depression Chuck about 300 km southwest of Manila on 24 June and moved at 16 km/h towards the west-northwest. It intensified to a tropical storm about 460 km southeast of Xisha on 25 June and slowed down to 7 km/h while tracking to the west. During the night, Chuck intensified further to a severe tropical storm about 360 km southeast of Xisha and took on a northwestward track towards Hainan Island. On the morning of 26 June, winds of over 100 km/h were reported by a ship, 'Chilham Castle', about 110 km south of the centre of Chuck. Typhoon intensity was attained on the morning of 27 June just before Chuck swept across Xisha Qundao. At Xisha during the closest approach of Chuck, the mean sea-level pressure of 966.2 hPa was recorded.

Turning gradually west-northwestwards at 18 km/h, Chuck made landfall over the southern coast of Hainan on the morning of 28 June. A weather observing station (Yaxian: 59948) recorded a mean sea-level pressure of 964.1 hPa as Chuck passed 40 km to its north-northeast that morning. After traversing the southwestern part of Hainan, Chuck entered Beibu Wan that evening. Still maintaining typhoon intensity, Chuck tracked to the northwest at 13 km/h over Beibu Wan. It made landfall over the northern part of Vietnam about 100 km east-southeast of Hanoi on the evening of 29 June and weakened rapidly over land. It finally dissipated in northern Vietnam on 30 June.

In Hainan one person was killed and 19 others were injured. Houses damaged or destroyed totalled nearly 29 000. About 54 000 hectares of agricultural land were affected and almost 1 400 heads of livestock were killed. About 100 hectares of fresh water fish ponds were affected and 89 fishing boats capsized. Direct economic loss was estimated at 223 million RMB. Records of storm surge were also reported along the coastal areas of Guangxi. An estimated 7 000 hectares of rice paddy and fish ponds were ruined. More than 700 dykes were damaged and one person was killed.

In northern Vietnam where Chuck landed, five people were killed, nine were reported missing and three were injured. Tens of ships capsized and dykes were ruined. In Hanoi, low-lying areas were flooded. About 500 trees were uprooted and 140 houses were damaged.

In Hong Kong the Stand By Signal No. 1 was hoisted at 8.50 a.m. on 27 June when Typhoon Chuck was about 690 km to the south-southwest. At the time, the weather was fine with moderate easterly winds, strong at times offshore. As winds continued to strengthen that night, the Strong Wind Signal No. 3 was hoisted at 8.15 p.m. when Typhoon Chuck was about 620 km to the south-southwest. Gale force winds affected offshore areas during the night. Rain also started that night and became heavy with squalls the next day. Chuck came closest to Hong Kong at about 2 a.m. on 28 June when it was about 600 km to the southwest. At the Royal Observatory, the lowest sea-level pressure of 999.0 hPa was recorded at about 4 p.m. the previous day. All signals were lowered at 2.00 p.m. on 28 June when Chuck was over Hainan Island about 650 km to the southwest of Hong Kong. As winds moderated, rain became infrequent on 29 June and fine weather returned on 30 June.

Torrential rain on 28 June caused flooding in the southern part of Hong Kong Island, the Mid-levels and Western District. Altogether 57 cases of flooding were reported. In Wong Chuk Hang, flood water was reported to be about one metre high. A 10-metre tree collapsed in Tin Hau Temple Street and another one toppled in Conduit Road. In Tsz Wan Shan, a signboard was blown to a state of near collapse. A pier was also damaged by sea waves in Shek Pik. Fortunately, no casualties were reported during the approach of Chuck. Some ferry services to China were also affected.

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

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

	Maximum Gust				*Maximum Hourly Wind*			
Station (see Fig. 1)	*Direction*	*Speed(km/h)*	*Date*	*Time*	*Direction*	*Speed(km/h)*	*Date*	*Time*
Royal Observatory	E	65	28 Jun	1227	E	31	27 Jun	2200
	ENE	65	28 Jun	1320	E	31	27 Jun	2300
Central	ESE	59	28 Jun	1210	E	34	27 Jun	1100
Cheung Chau	E	77	27 Jun	2314	E	49	28 Jun	1200
					E	49	28 Jun	1300
H.K. Airport(SE)	E	76	27 Jun	2258	E	36	27 Jun	2300
H.K. Airport(NW)	NE	113	27 Jun	1255	E	36	27 Jun	2300
Kwai Chung	ENE	47	27 Jun	1209	ENE	19	27 Jun	1400
Lau Fau Shan	E	59	27 Jun	2230	E	31	27 Jun	2300
Sha Tin	NNE	65	27 Jun	1313	E	22	27 Jun	2300
Star Ferry	E	63	27 Jun	2319	E	31	27 Jun	2300

Station (see Fig. 1)	*Maximum Gust*				*Maximum Hourly Wind*			
	Direction	*Speed(km/h)*	*Date*	*Time*	*Direction*	*Speed(km/h)*	*Date*	*Time*
Ta Kwu Ling	ENE	52	28 Jun	0738	E	20	27 Jun	2200
					E	20	28 Jun	0300
					E	20	27 Jun	1300
Tai Mo Shan	ESE	99	27 Jun	2347	ESE	72	27 Jun	2100
Tai Po Kau	E	59	28 Jun	0318	E	41	28 Jun	0400
Tate's Cairn	ENE	99	28 Jun	0645	E	62	27 Jun	2300
Tsing Yi	ENE	62	27 Jun	1758	E	31	27 Jun	1300
Tuen Mun	E	63	27 Jun	1449	E	22	27 Jun	1400
Waglan Island	E	104	28 Jun	0859	E	75	28 Jun	0700
Wong Chuk Hang	NE	72	28 Jun	0218	E	31	28 Jun	0700

Stations with incomplete record:
Green Island
Sai Kung
Tseung Kwan O

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

Station (See Fig. 5)	*27 Jun*	*28 Jun*	*29 Jun*	*30 Jun*	*Total*
Royal Observatory	Trace	109.5	6.0	Trace	115.5
H09 (HK Island (east))	Nil	125.0	5.0	Nil	130.0
H12 (HK Island (west))	Nil	162.5	1.5	0.5	164.5
H15 (HK Island (south))	Nil	116.0	Nil	Nil	116.0
K04 (Kowloon (east))	0.5	85.5	10.5	3.5	100.0
K06 (Kowloon (west))	0.5	71.0	1.0	0.5	73.0
N17 (Lantau)	Nil	42.5	Nil	1.0	43.5
N05 (Sheung Shui—Sha Tau Kok)	Nil	21.5	11.0	Nil	32.5
N13 (Sai Kung)	1.0	33.0	9.0	0.5	43.5
N02 (Sha Tin)	Nil	73.5	3.0	Nil	76.5
R31 (Tai Po)	Nil	34.0	3.5	1.0	38.5
N14 (Tsuen Wan—Kwai Chung)	Nil	105.5	1.5	1.0	108.0
N07 (Tuen Mun)	Nil	62.0	Nil	Nil	62.0
R28 (Yuen Long)	Nil	58.0	0.5	1.0	59.5

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

Station (See Fig. 1)	Maximum sea level above chart datum			Maximum storm surge above astronomical tide		
	Height (m)	Date	Time	Height (m)	Date	Time
Ko Lau Wan	2.73	28 Jun	7.05 a.m.	0.69	28 Jun	3.23 p.m.
Lok On Pai	2.68	28 Jun	7.01 a.m.	0.54	28 Jun	2.10 a.m.
Quarry Bay	2.63	28 Jun	7.32 a.m.	0.55	28 Jun	9.01 p.m.
Tai O	2.73	28 Jun	7.23 a.m.	0.62	28 Jun	4.07 p.m.
Tai Po Kau	2.65	28 Jun	7.06 a.m.	0.68	28 Jun	8.35 a.m.
Tsim Bei Tsui	2.86	28 Jun	7.43 a.m.	0.65	28 Jun	9.57 p.m.

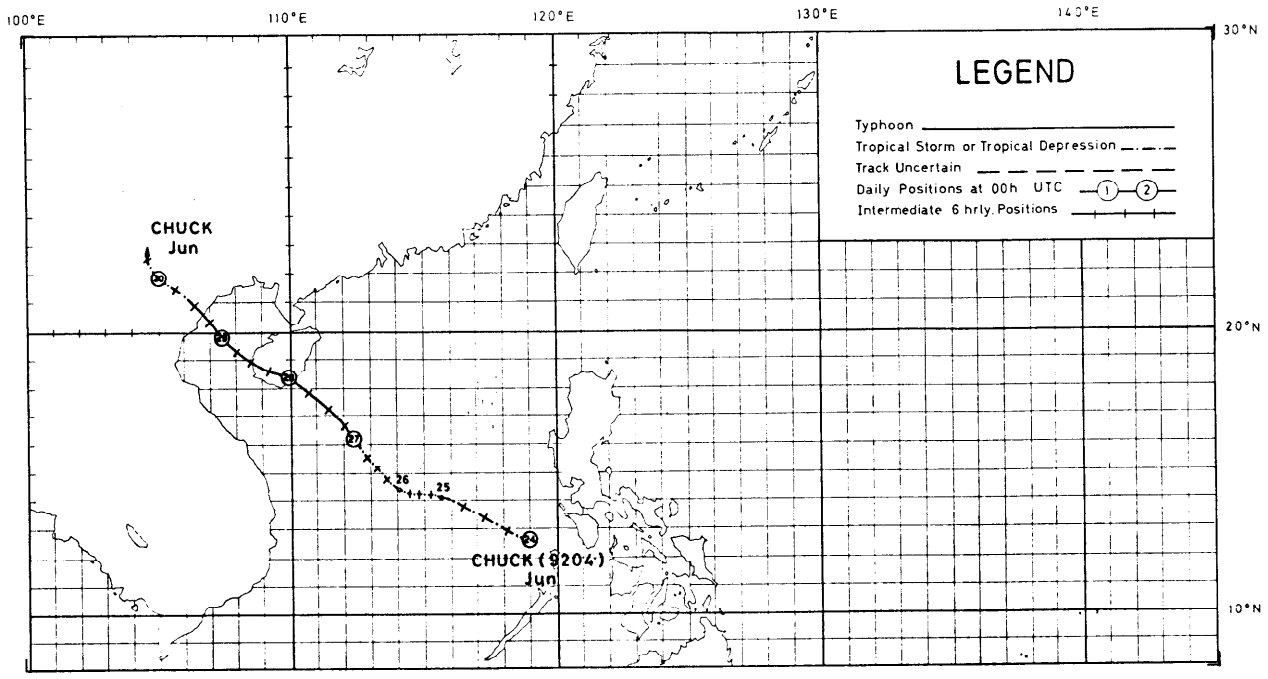


Figure 4. Track of Typhoon Chuck (9204): 24–30 June 1992

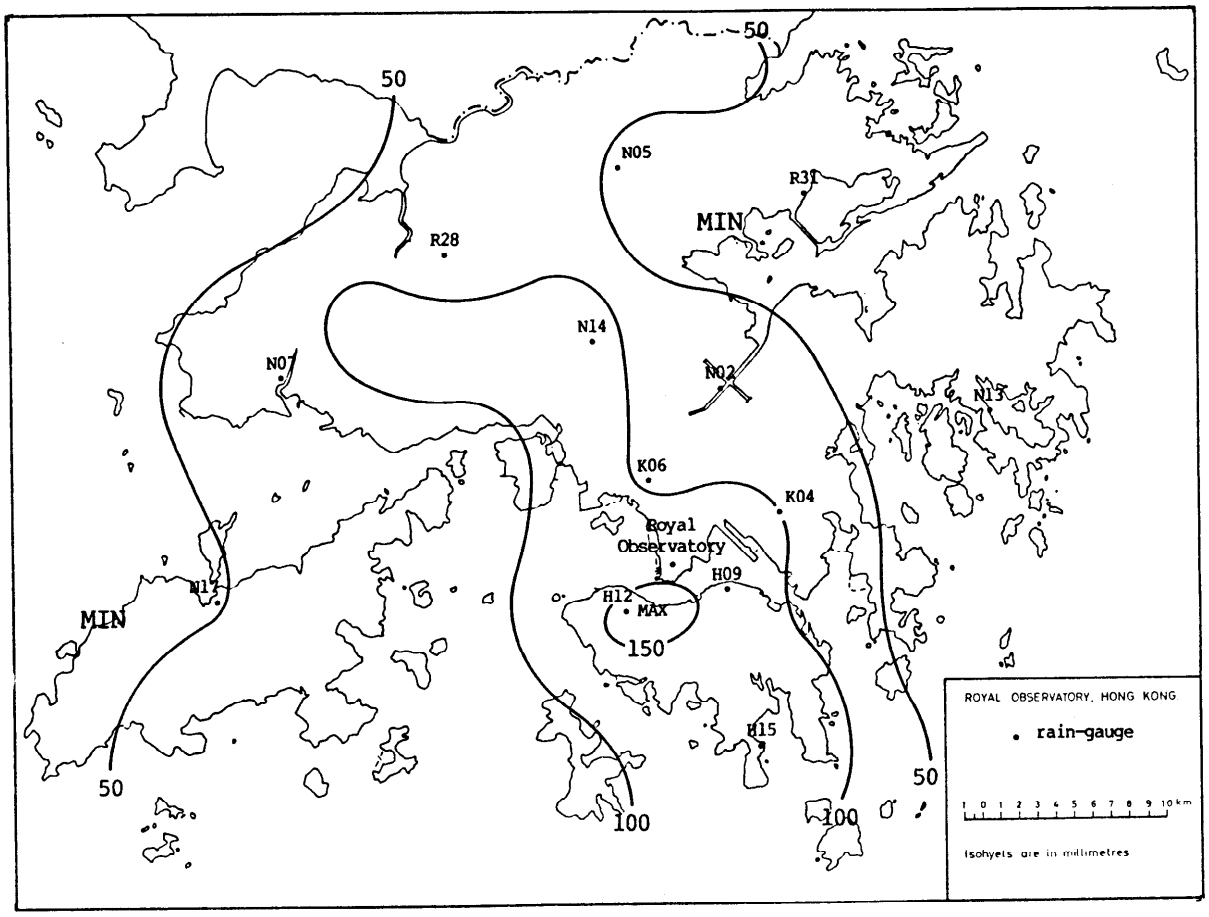


Figure 5. Rainfall (mm) distribution on 27–30 June 1992

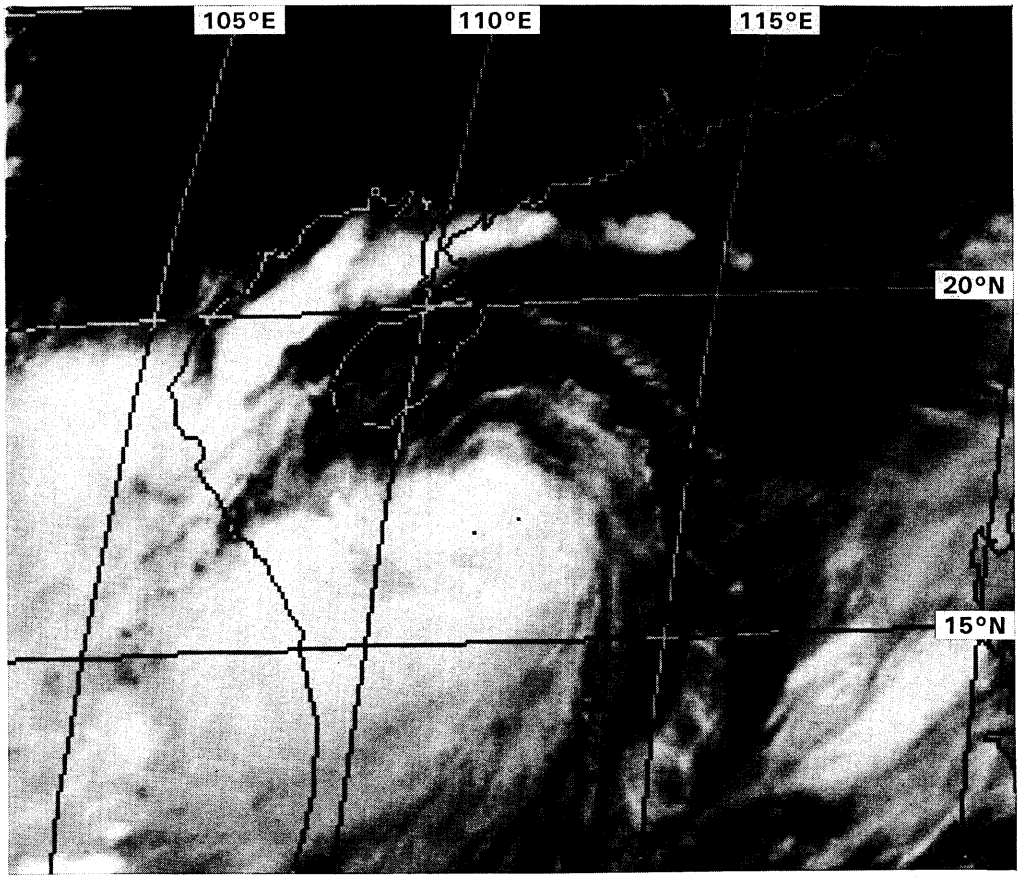


Figure 6. GMS-4 infra-red imagery of Chuck at around 5 p.m. on 27 June 1992.

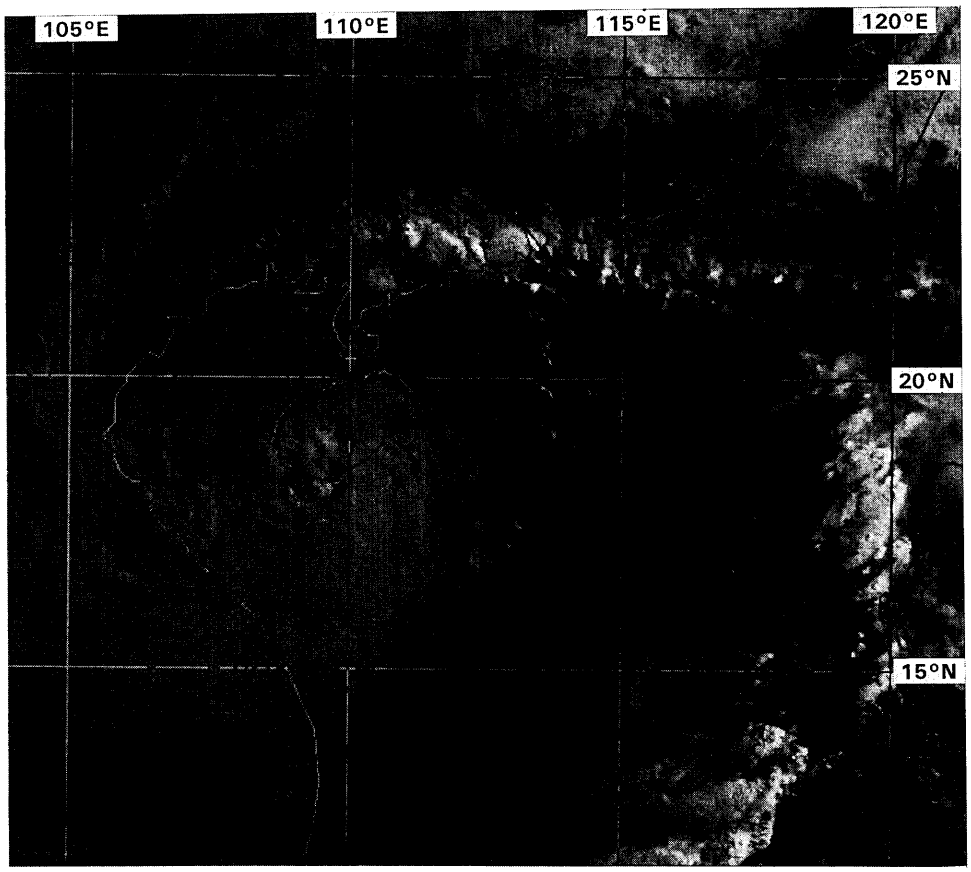


Figure 7. GMS-4 visible imagery of Chuck at around 8 a.m. on 28 June 1992.

Figure 8. **A 10-metre tall tree was blown down on Tin Hau Temple Road (by courtesy of Ming Pao Daily News).**

(b) Typhoon Eli (9205)

9-14 July 1992

The track of Eli is shown in Figure 9

Eli was a fast-moving tropical cyclone. It formed as a tropical depression over the western North Pacific about 490 km northwest of Yap on 9 July. Moving west-northwestwards at 31 km/h, it soon intensified to a tropical storm about 840 km west-northwest of Yap early on 10 July. Eli intensified further to a severe tropical storm about 790 km east of Manila that day and took on a more westward track that night. It attained typhoon intensity about 190 km northeast of Manila on the morning of 11 July just prior to landfall over central Luzon. In Luzon, one boy was killed and eight people were reported missing during the passage of Eli.

After moving past Baguio on a west-northwestward track, a weakened Eli entered the South China Sea as a severe tropical storm on the afternoon of 11 July. It turned westwards at about 30 km/h that evening before reverting to a west-northwestward track the next day. Eli regained typhoon intensity early on 13 July. It landed over the east coast of Hainan Island about 100 km south-southeast of Haikou and traversed the northern part of the island during the day. Eli weakened to a severe tropical storm over Beibu Wan and made landfall over northern Vietnam about 160 km east of Hanoi during the night. Moving further inland, it weakened rapidly to a tropical depression before degenerating into an area of low pressure on 14 July.

Eli caused widespread damage in northern Hainan. According to news reports, some houses collapsed and electricity cables were damaged. Crops and agricultural produce were destroyed while fish ponds were inundated. Total economic loss in Hainan was estimated at 1.5 billion RMB.

In Hong Kong, the weather was fine on 11 July. The Stand By Signal No.1 was hoisted at 8.30 p.m. that evening when Eli was 760 km southeast of Hong Kong. Winds were light and variable at first, but strengthened gradually from the east. The Strong Wind Signal No.3 was hoisted the next morning at 10.00 a.m. when Eli was 580 km south of Hong Kong. As Eli moved closer, squally showers associated with its outer rainbands began to affect local areas on the afternoon of 12 July. Winds became fresh inside Victoria Harbour and strong offshore and on high ground. The closest approach of Eli occurred at about 5 a.m. on 13 July when Eli was 480 km southwest of Hong Kong. The lowest sea level pressure of 1 008.9 hPa was recorded at the Royal Observatory an hour earlier. As Eli continued to move west-northwestwards away from Hong Kong, all signals were lowered at 9.45 a.m. on 13 July when Eli was 520 km southwest of Hong Kong. The weather remained cloudy with showers. Local winds gradually subsided during the evening. As Eli landed over Vietnam and dissipated, showery activity eased off on 14 July.

In Hong Kong one worker was injured when he was working on a boat in rough seas off Tsing Yi. Fourteen passengers were hurt as a hydrofoil hit the pier in Tuen Mun. Another eight people were injured in weather-related traffic accidents. Ferry services to China and Macau were cancelled or suspended.

The rainfall distribution associated with Eli is shown in Figure 10. Information on wind, rainfall and tide during the passage of Eli is given as follows:

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

	Maximum Gust				*Maximum Hourly Wind*			
Station (see Fig. 1)	*Direction*	*Speed(km/h)*	*Date*	*Time*	*Direction*	*Speed(km/h)*	*Date*	*Time*
Royal Observatory	E	59	12 Jul	1148	E	31	12 Jul	1200
Central	ESE	65	12 Jul	1348	E	27	12 Jul	1200
Cheung Chau	ESE	81	12 Jul	1406	ESE	52	13 Jul	0400
Green Island	ESE	79	13 Jul	0525	ENE	49	12 Jul	1200
H.K. Airport(SE)	E	81	12 Jul	1348	E	40	12 Jul	1500
H.K. Airport(NW)	E	137	12 Jul	1357	E	41	12 Jul	1400
King's Park	ESE	56	12 Jul	1349	SE	23	13 Jul	0500
	SE	56	12 Jul	1350				
Kwai Chung	ESE	52	12 Jul	1401	ESE	23	13 Jul	0800
Lau Fau Shan	ESE	59	12 Jul	1417	E	31	12 Jul	1300
Sha Tin	E	49	12 Jul	1201	E	19	12 Jul	1300
Star Ferry	E	70	12 Jul	1347	ESE	31	13 Jul	0700
					ESE	31	13 Jul	0800
Ta Kwu Ling	ESE	62	12 Jul	1352	ESE	20	12 Jul	1500
Tai Mo Shan	ESE	103	13 Jul	0449	ESE	76	13 Jul	0600
	ESE	103	13 Jul	0554				
Tai Po Kau	ESE	65	13 Jul	0746	E	38	12 Jul	1300
Tate's Cairn	ESE	108	12 Jul	1346	E	51	12 Jul	1500
Tseung Kwan O	S	59	13 Jul	0621	S	20	13 Jul	0900
Tsing Yi	ESE	62	12 Jul	1402	ESE	31	13 Jul	0900
Tuen Mun	SE	67	13 Jul	0821	SE	22	13 Jul	0900
Waglan Island	E	90	12 Jul	2157	E	56	12 Jul	1400
	E	90	12 Jul	2207				
Wong Chuk Hang	ESE	65	12 Jul	1142	E	30	13 Jul	0600

Station with incomplete record:
Sai Kung

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

Station (See Fig. 10)	*11 Jul*	*12 Jul*	*13 Jul*	*Total*
Royal Observatory	Nil	27.2	9.8	37.0
H09 (HK Island (east))	Nil	29.0	6.0	35.0
H12 (HK Island (west))	Nil	21.0	3.5	24.5
H15 (HK Island (south))	Nil	24.0	16.0	40.0
K04 (Kowloon (east))	Nil	39.0	12.5	51.5
K06 (Kowloon (west))	Nil	23.5	11.5	35.0
N17 (Lantau)	Nil	39.5	3.5	43.0
N05 (Sheung Shui—Sha Tau Kok)	Nil	11.0	1.5	12.5
N13 (Sai Kung)	Nil	39.5	13.0	52.5
N02 (Sha Tin)	Nil	38.0	10.5	48.5
R31 (Tai Po)	Nil	11.5	6.5	18.0
N14 (Tsuen Wan—Kwai Chung)	Nil	44.5	10.5	55.0
N07 (Tuen Mun)	Nil	10.0	0.5	10.5
R28 (Yuen Long)	Nil	46.0	9.0	55.0

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

Station (See Fig. 1)	Maximum sea level above chart datum			Maximum storm surge above astronomical tide		
	Height (m)	Date	Time	Height (m)	Date	Time
Chi Ma Wan	2.59	13 Jul	6.56 a.m.	0.37	13 Jul	11.34 a.m.
Ko Lau Wan	2.40	13 Jul	5.55 a.m.	0.33	13 Jul	7.09 a.m.
Lok On Pai	2.59	13 Jul	7.51 a.m.	0.32	13 Jul	6.26 a.m.
Quarry Bay	2.41	13 Jul	6.26 a.m.	0.28	13 Jul	6.21 a.m.
Tai O	2.63	13 Jul	8.30 a.m.	0.27	13 Jul	11.38 p.m.
Tai Po Kau	2.38	13 Jul	5.30 a.m.	0.41	13 Jul	5.30 a.m.
Tsim Bei Tsui	2.87	13 Jul	7.59 a.m.	0.38	13 Jul	7.30 a.m.

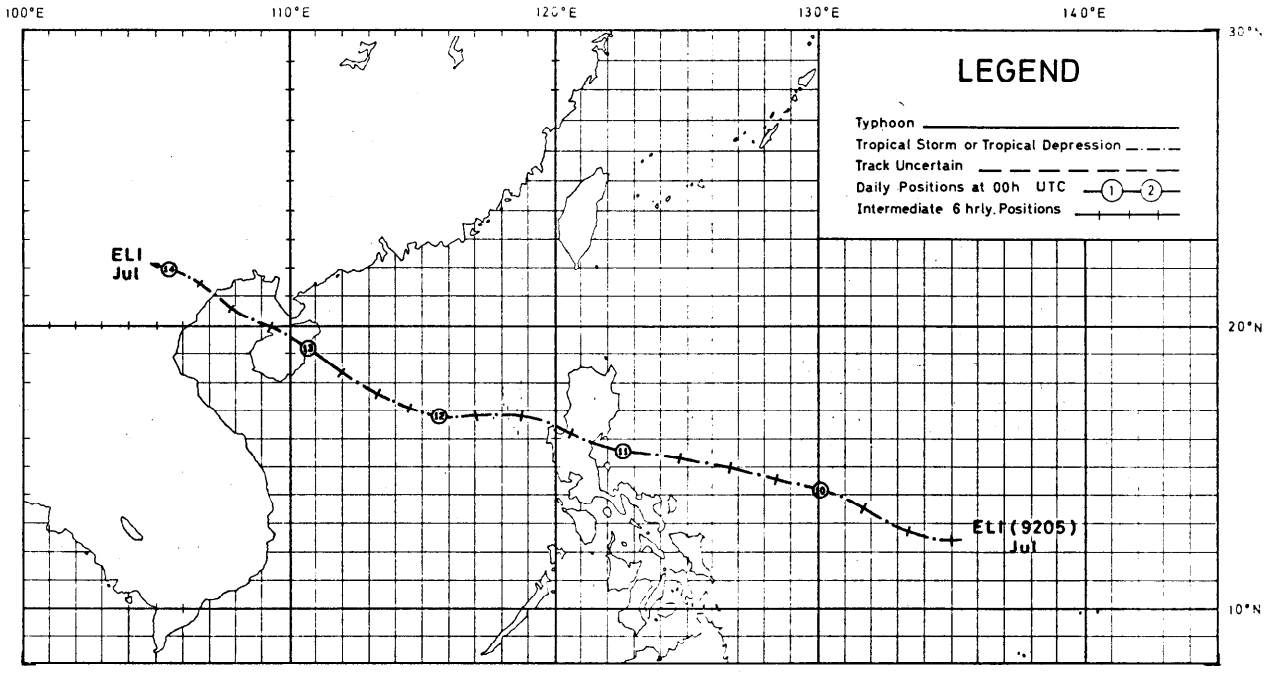


Figure 9. Track of Typhoon Eli (9205): 9-14 July 1992.

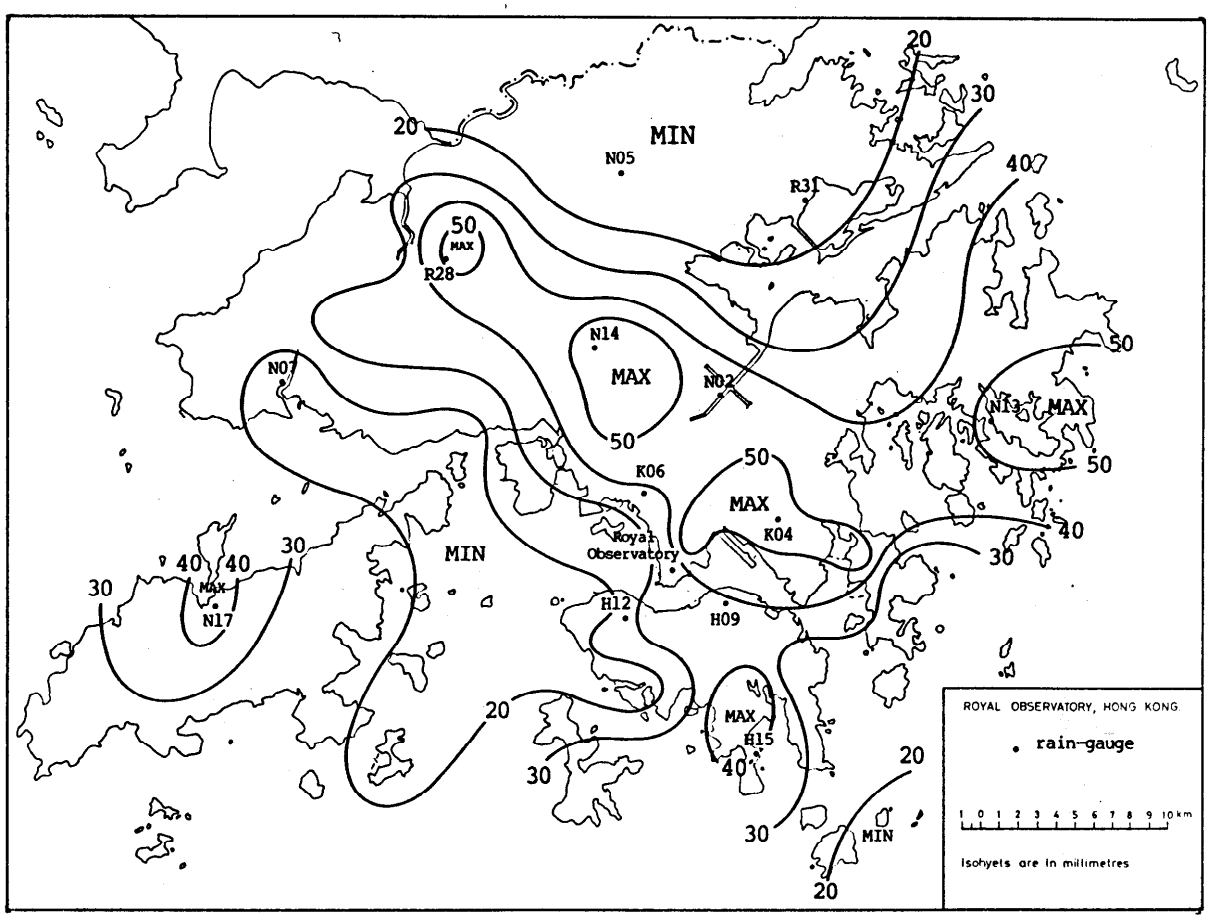


Figure 10. Rainfall (mm) distribution on 11-13 July 1992.

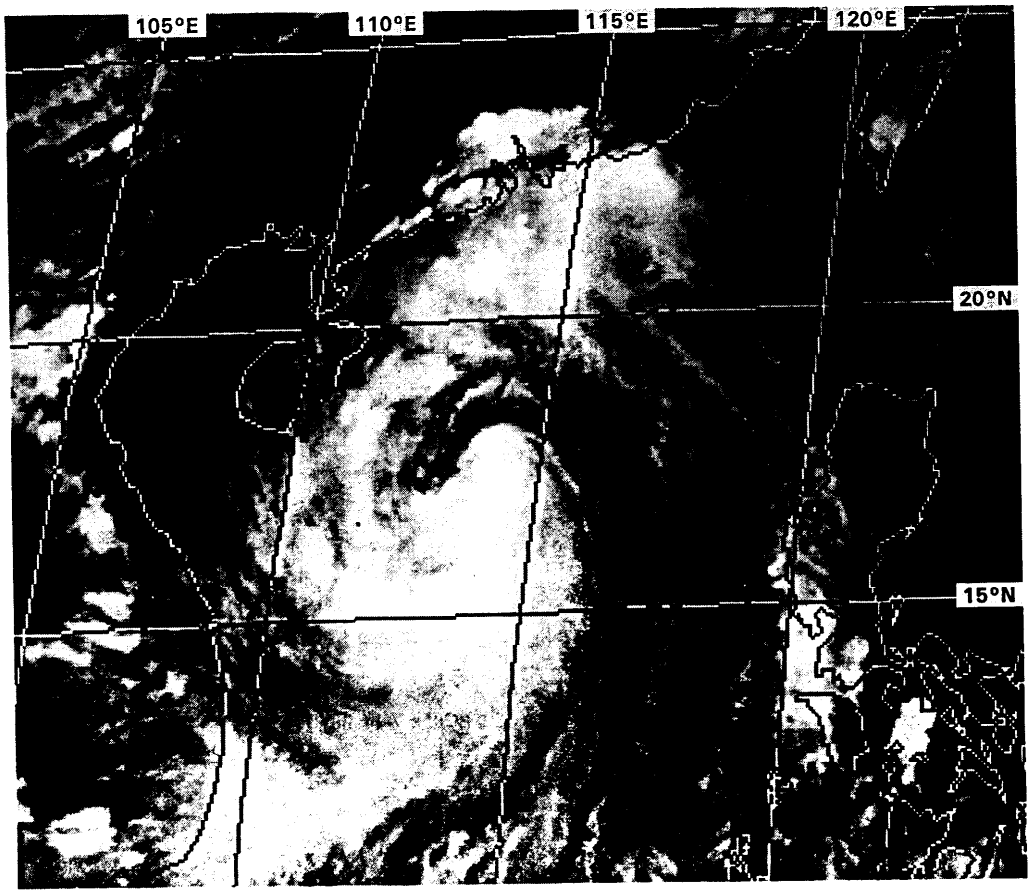


Figure 11. GMS-4 infra-red imagery of Eli at around 5 p.m. on 12 July 1992.

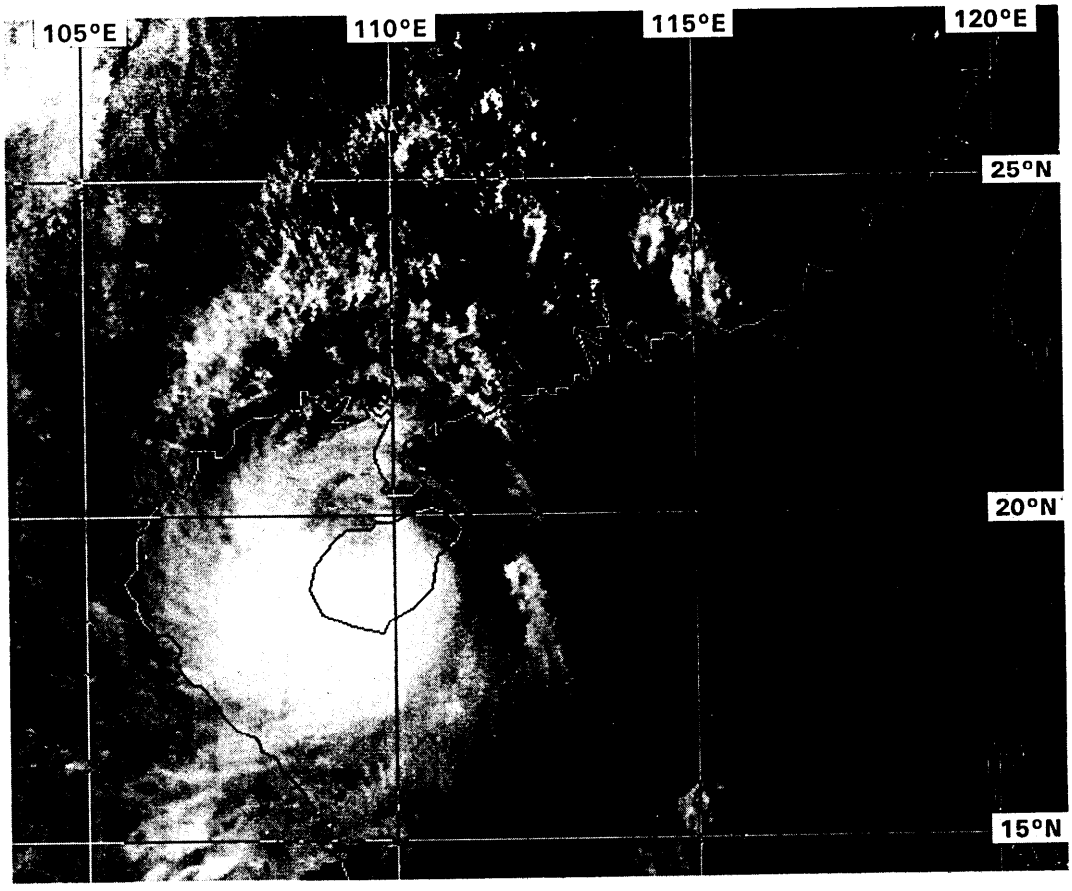


Figure 12. GMS-4 visible imagery of Eli at around 2 p.m. on 13 July 1992.

(c) Tropical Storm Faye (9206)

17-18 July 1992

The track of Faye is shown in Figure 13

Although Faye was a tropical storm with a short life span, it was at its fiercest when it made landfall near Hong Kong on 18 July and produced one of the most severe rainstorms seen in the passages of tropical cyclones,

Faye originated from an area of low pressure over the western North Pacific to the east of the Philippines on 14 July. It moved across the northern tip of Luzon the next day and entered the South China Sea in the evening. The disturbance drifted westwards across the northern part of the South China Sea on 16 July with no significant intensification. But during the night, it turned northwards and intensified. It became Tropical Depression Faye about 240 km south of Hong Kong on the morning of 17 July and moved at a speed of 12 km/h towards the Pearl River estuary. Faye turned momentarily to the north-northwest later that day and intensified to a tropical storm about 110 km south-southwest of Hong Kong that evening. During the night, Faye turned back towards the Pearl River estuary on a north-northeastward track, skirting past just to the east of Macau on the morning of 18 July. It made landfall later that morning about 50 km northwest of the Royal Observatory Headquarters and moved into eastern Guangdong. Faye eventually dissipated over land about 150 km north-northeast of Hong Kong that evening.

In Hong Kong, the Stand By Signal No. 1 was hoisted at 9.00 a.m. on 17 July when Faye developed into a tropical depression. At that time, Faye was about 230 km to the south. The weather was cloudy with some rain. Winds were moderate easterly at first but freshened during the day. The Strong Wind Signal No. 3 replaced the Stand By Signal No. 1 at 11.50 p.m. as Faye, located about 100 km southwest of Hong Kong at the time, continued to intensify and drifted closer to the coast. Winds turned southerly and strengthened during the night. Conditions deteriorated in the early hours of 18 July and became stormy as Faye moved into the Pearl River estuary. By the morning, torrential rain accompanied by severe squalls associated with a landing Faye battered Hong Kong, with the western part of the territory bearing the brunt of the rainstorms. Severe squalls and frequent thunderstorms persisted for most part of the day before easing off in the evening as Faye weakened. The heaviest rain fell in the northwestern part of the New Territories where daily rainfall amount exceeding 300 millimetres was recorded. Faye came closest at about 9 a.m. on 18 July when it was about 50 km west-northwest of the Royal Observatory Headquarters. The lowest sea-level pressure of 1 003.6 hPa was recorded at 6 a.m. and 7 a.m. at the Royal Observatory. After Faye landed, winds over Hong Kong quickly subsided. All signals were lowered at 4.05 p.m. on 18 July when a dissipating Faye was about 100 km to the north. The weather soon turned sunny on 19 July.

In Hong Kong, two people were killed and 24 were injured during the passage of Faye. Altogether, 152 cases of flooding and 40 cases of landslip were reported. Flooding was most severe in the northwestern part of the New Territories, particularly in Yuen Long, Kam Tin and San Tin. Landslips occurred in Tsuen Wan, Kwai Chung, Tuen Mun, Cheung Chau, Sha Tin and Hong Kong Island. A landslip in Tai Wo Village in Tsuen Wan led to the evacuation of 200 people from 40 squatter houses. Collapse of scaffoldings occurred in Wan Chai, Central and Tsim Sha Tsui while a brick wall crumbled in Central. Trees were blown down in Mount Davis Road, Happy Valley and Ho Man Tin. In the New Territories, about one-fifth of the total agricultural land was inundated. The worst affected areas were Pat Heung, Kam Tin, Sha Tau Kok, Ta Kwu Ling and Sheung Shui. Farmers reported a loss of 1 000 tonnes of vegetables at an estimated cost of HK$3 million. More than 20 000 heads of poultries, 800 pigs and over 100 tonnes of fresh-water fish were lost. The damage incurred was estimated to be over HK$5 million. In Hong Kong waters, a Greek container, 'Inchon Glory', ran aground off Lamma Island and a barge suffered the same fate near Tsing Yi Island. Two other barges crashed into the Tsing Yi South Bridge, forcing the closure of one lane of the bridge for at least a month and restricting the vehicular traffic to and from the island. Ferry services to China and Macau were also suspended. At the airport, international flights were cancelled or delayed on the morning of 18 July.

In southern China, air traffic in Guangzhou and Shenzhen airports was affected. Heavy rain also disrupted the power supply to the Shenzhen airport.

In Macau, torrential rain caused flooding in many places. Gales brought by Faye also led to the closure of the Macau-Taipa bridge for several hours.

The rainfall distribution associated with Faye is shown in Figure 14. Information on wind, rainfall and tide during the passage of Faye is given as follows:

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

	Maximum Gust				*Maximum Hourly Wind*			
Station (scc Fig. 1)	*Direction*	*Speed(km/h)*	*Date*	*Time*	*Direction*	*Speed(km/h)*	*Date*	*Time*
Royal Observatory	S	92	18 Jul	0814	S	38	18 Jul	1000
Central	ESE	112	18 Jul	0836	ESE	45	18 Jul	0700
Cheung Chau	S	133	18 Jul	0905	SE	79	18 Jul	0600
H.K. Airport(SE)	S	113	18 Jul	0930	S	51	18 Jul	1000
H.K. Airport(NW)	S	106	18 Jul	0910	S	59	18 Jul	1000

Station (see Fig. 1)	*Maximum Gust*				*Maximum Hourly Wind*			
	Direction	*Speed(km/h)*	*Date*	*Time*	*Direction*	*Speed(km/h)*	*Date*	*Time*
King's Park	SSE	94	18 Jul	0752	S	36	18 Jul	1000
Kwai Chung	SSE	81	18 Jul	0754	SSE	38	18 Jul	0700
Lau Fau Shan	SE	146	18 Jul	0857	SE	76	18 Jul	1000
Sai Kung	SSW	77	18 Jul	0754	S	31	18 Jul	0800
Sha Tin	SSW	76	18 Jul	0924	SSW	34	18 Jul	1000
Star Ferry	ESE	103	18 Jul	0601	ESE	43	18 Jul	0600
Ta Kwu Ling	SSW	88	18 Jul	1108	S	34	18 Jul	1100
Tai Mo Shan	SSE	113	18 Jul	0631	SSE	76	18 Jul	0700
Tai Po Kau	SSE	76	18 Jul	1030	E	30	17 Jul	2000
Tate's Cairn	SSW	128	18 Jul	1018	S	70	18 Jul	1100
Tseung Kwan O	SSW	85	18 Jul	0954	S	43	18 Jul	0700
Tsing Yi	S	103	18 Jul	0928	S	59	18 Jul	0800
Tuen Mun	SSE	121	18 Jul	0919	SSE	45	18 Jul	0900
Waglan Island	S	135	18 Jul	0653	SSW	94	18 Jul	0800
Wong Chuk Hang	W	75	18 Jul	1033	WNW	30	18 Jul	0900

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

Station (See Fig. 14)	*17 Jul*	*18 Jul*	*Total*
Royal Observatory	6.7	177.7	184.4
H07 (HK Island (east))	8.0	148.5	156.5
H04 (HK Island (west))	8.0	205.0	213.0
H20 (HK Island (south))	3.5	119.5	123.0
K04 (Kowloon (east))	9.0	113.5	122.5
K06 (Kowloon (west))	4.5	138.0	142.5
68 (Lantau)	2.8	165.9	168.7
N05 (Sheung Shui—Sha Tau Kok)	3.0	214.0	217.0
N13 (Sai Kung)	11.0	94.0	105.0
N02 (Sha Tin)	4.0	188.5	192.5
R31 (Tai Po)	5.5	122.5	128.0
N06 (Tsuen Wan—Kwai Chung)	3.5	262.0	265.0
R21 (Tuen Mun)	2.0	226.0	228.0
R26 (Shek Kong)	1.5	303.0	304.5

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

Station (See Fig. 1)	Maximum sea level above chart datum			Maximum storm surge above astronomical tide		
	Height (m)	Date	Time	Height (m)	Date	Time
Chi Ma Wan	2.41	18 Jul	10.17 a.m.	0.37	18 Jul	7.59 a.m.
Ko Lau Wan	2.29	18 Jul	8.21 a.m.	0.28	18 Jul	8.18 a.m.
Lok On Pai	2.49	18 Jul	10.36 a.m.	0.44	18 Jul	9.55 a.m.
Quarry Bay	2.25	18 Jul	10.13 a.m.	0.25	18 Jul	8.24 a.m.
Tai Po Kau	2.32	18 Jul	8.54 a.m.	0.45	18 Jul	8.54 a.m.
Tsim Bei Tsui	3.27	18 Jul	11.41 a.m.	0.75	18 Jul	11.41 a.m.

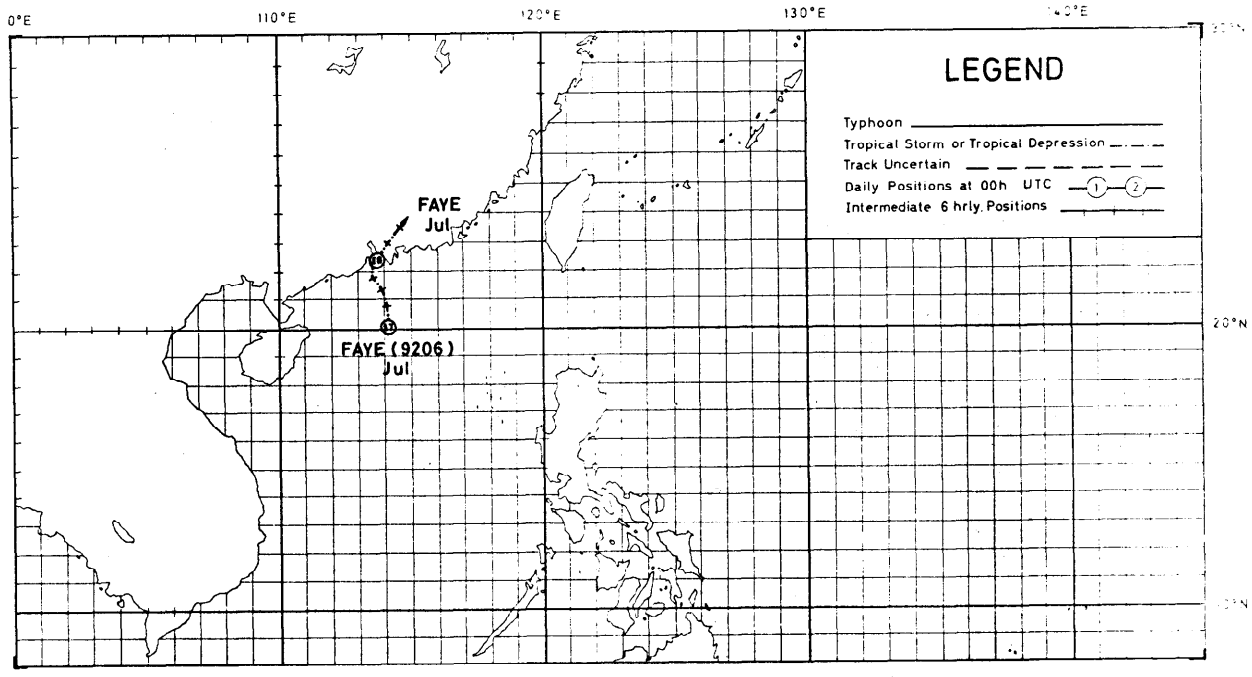


Figure 13. Track of Tropical Storm Faye (9206): 17–18 July 1992.

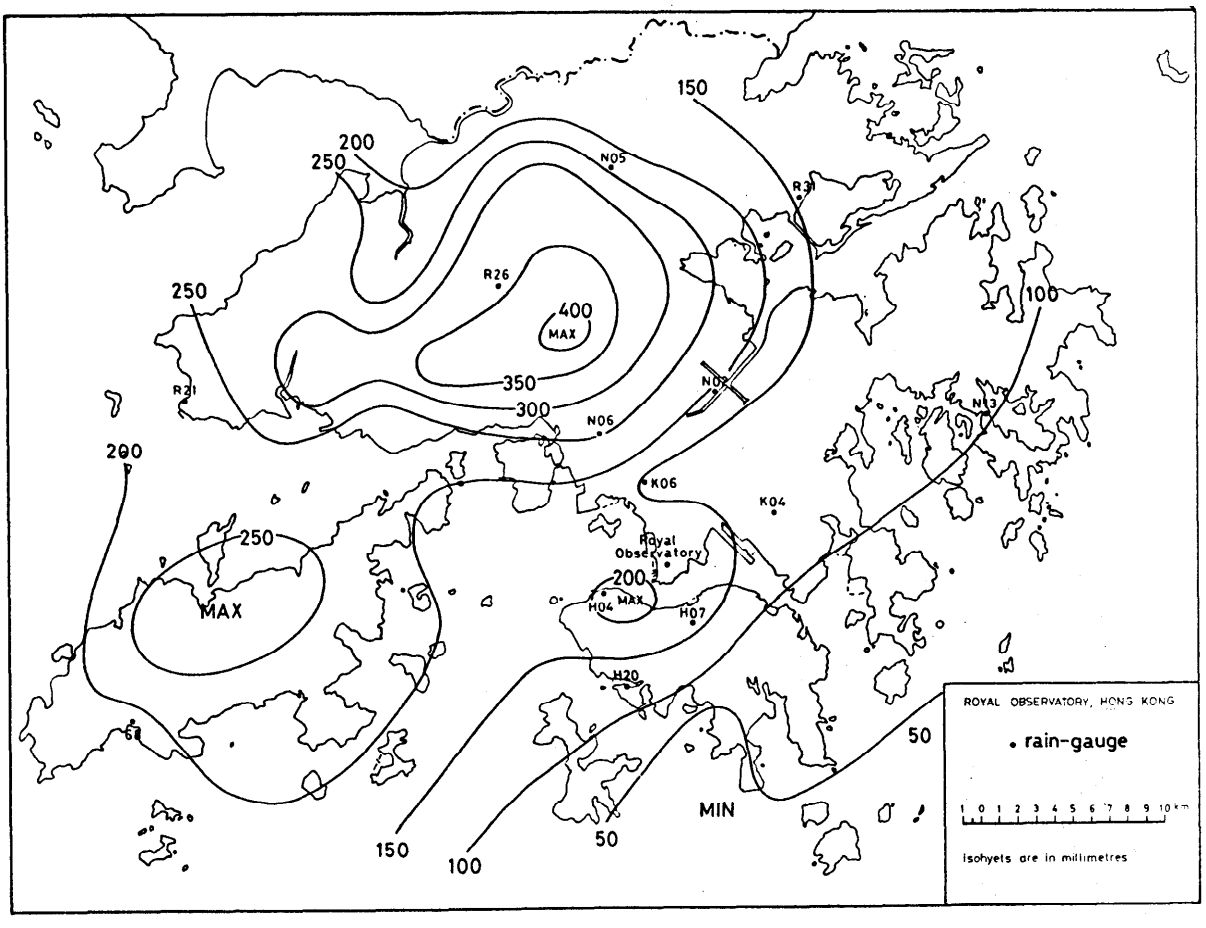


Figure 14. Rainfall (mm) distribution on 17–18 July 1992.

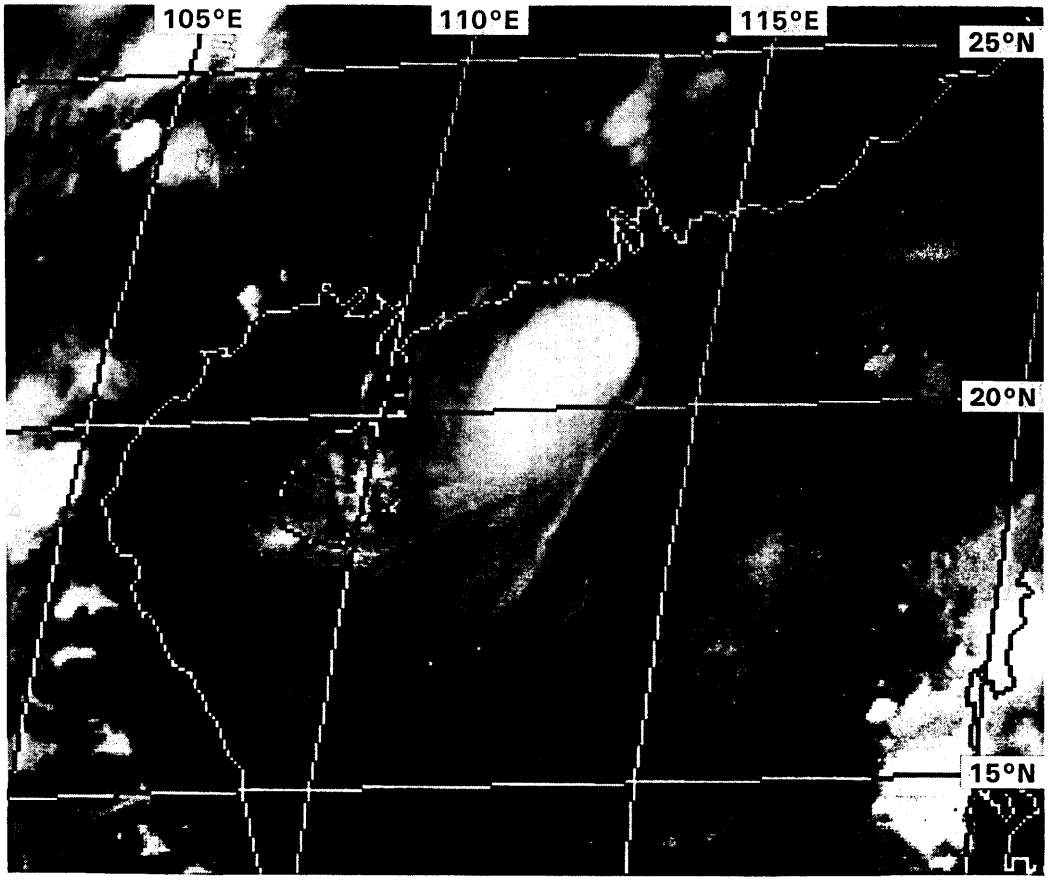


Figure 15. GMS-4 infra-red imagery of Faye at around 8 p.m. on 17 July 1992.

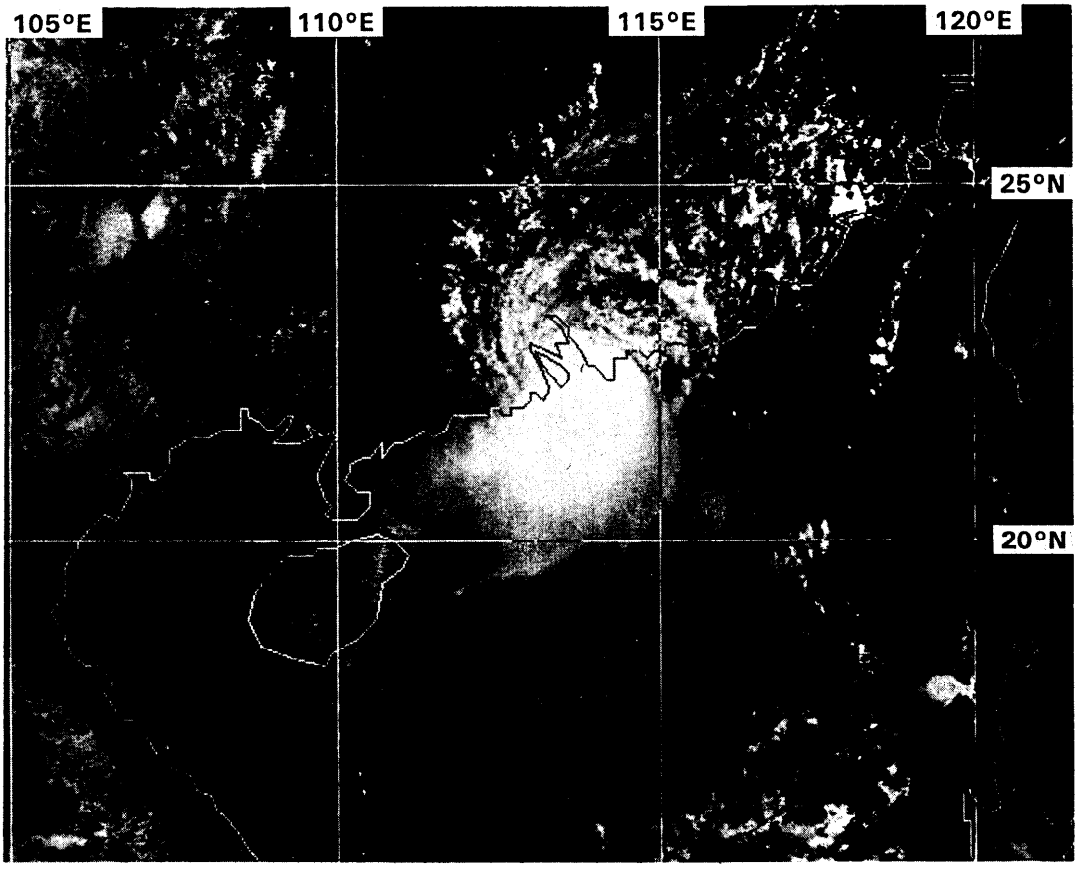


Figure 16. GMS-4 visible imagery of Faye at around 11 a.m. on 18 July 1992.

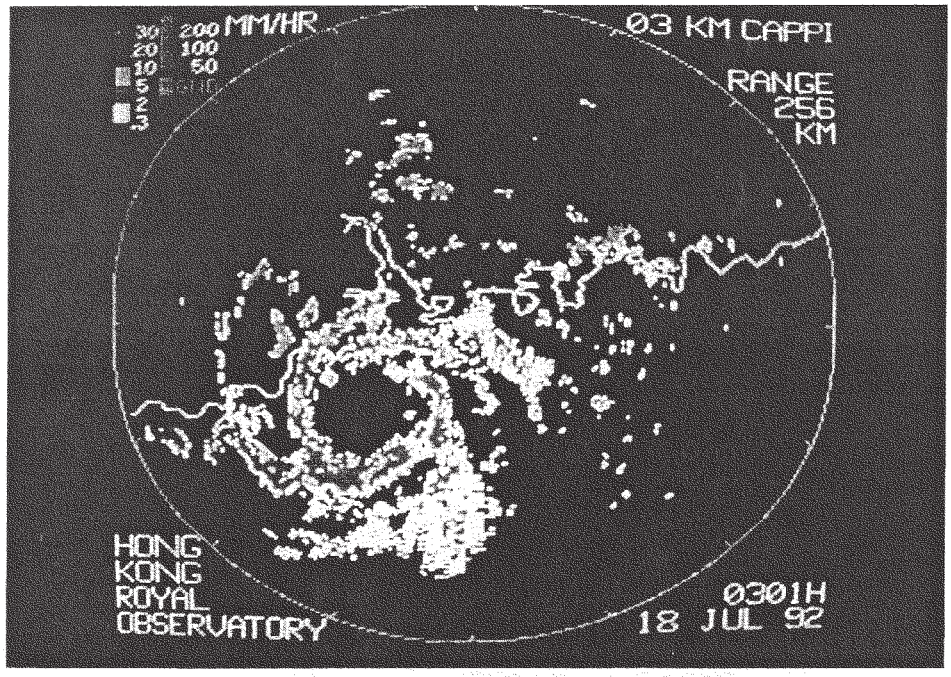


Figure 17. Radar display of the rain echoes of Faye at 3.01 a.m. on 18 July 1992.

Figure 18. Flooding in the New Territories following the heavy downpour due to Faye (by courtesy of Wah Kiu Yat Po).

Figure 19. A badly damaged section of the Tsing Yi South Bridge after it was hit by barges (by courtesy of Oriental Daily News).

Figure 20. Windows on Wan Chai Tower II broken by blustery winds (by courtesy of Oriental Daily News).

Figure 21. A barge aground near Tsing Yi Island (by courtesy of Oriental Daily News).

(d) Severe Tropical Storm Gary (9207)

19-23 July 1992

The track of Gary is shown in Figure 22

Gary developed into a tropical depression about 980 km east of Manila on the morning of 19 July and moved west-northwestwards rapidly at about 30 km/h. It landed over the east coast of Luzon about 280 km north-northeast of Manila the next morning. Slowing down to a speed of 23 km/h, Gary tracked northwestwards across northern Luzon during the day and turned westwards into the South China Sea that evening. In northern Luzon, 22 people were killed and more were reported missing.

Gary intensified to a tropical storm over the warm waters of the South China Sea on the evening of 20 July. It turned northwestwards the next day, moving at 20 km/h towards the coast of Guangdong. After intensifying to a severe tropical storm about 310 km south of Hong Kong early on 22 July, Gary took on a more westward track. As it approached the northeastern tip of Hainan Island, Gary turned northwestwards and hit Leizhou Peninsula, landing about 20 km southwest of Zhanjiang in the early hours of 23 July. It moved into Guangxi during the day and gradually weakened. By that evening, it had degenerated into a tropical depression about 180 km west of Nanning. As it moved further inland, Gary was downgraded to an area of low pressure during the night.

Gary inflicted extensive damage upon southwestern Guangdong and Guangxi. Gales and torrential rain caused disruptions in electricity supply, water supply and communication in Zhanjiang and neighbouring regions. According to news reports, one person was killed and nine were injured in Guangdong. About 20 000 houses collapsed and 100 000 others were damaged. An estimated 146 000 hectares of farmland were affected. Other major losses included 86 bridges, 700 boats and 362 kilometres of road. The total economic loss was estimated at 5 billion RMB. In Guangxi 25 people were killed and 54 were injured. About 23 000 houses collapsed or were damaged. 4 000 hectares of farmland were affected. Also damaged were 400 bridges, 680 kilometres of road and 304 kilometres of drainage pipes. The total loss in Guangxi was estimated at 1 billion RMB.

In Hong Kong the Stand By Signal No.1 was hoisted at 10.30 p.m. on 20 July when Gary was 770 km southeast of Hong Kong. Winds were light and variable, but became moderate northeasterly on the morning of 21 July. The weather turned cloudy with isolated showers. As winds strengthened gradually from the northeast in the afternoon, the Strong Wind Signal No.3 was hoisted at 3.45 p.m. when Gary was 470 km south-southeast of Hong Kong.

The No. 8 NORTHEAST Gale or Storm Signal was hoisted at 5.45 a.m. on 22 July when Gary was about 290 km to the south. Gale force winds were experienced offshore and in exposed areas of the territory. The No. 8 SOUTHEAST Gale or Storm Signal replaced the No. 8 NORTHEAST Gale or Storm Signal at 11.00 a.m. as Gary moved to the southwest quadrant of Hong Kong. At the time, Gary was 300 km south-southwest of Hong Kong. The closest approach occurred round about 7 a.m. on 22 July when Gary was 290 km south of Hong Kong. The lowest sea-level pressure of 1 002.4 hPa was recorded at the Royal Observatory at 2 p.m. that day. Showers became more frequent later during the day. The No. 8 SOUTHEAST Gale or Storm Signal was replaced by the Strong Wind Signal No.3 at 4.15 p.m. when Gary was 330 km to the southwest and continued to move away from Hong Kong. Local winds gradually subsided towards the evening. All signals were lowered at 6.50 p.m. when Gary no longer posed a threat to the territory. By then, Gary was located about 350 km southwest of Hong Kong. While Gary weakened over Guangxi, cloudy weather and intermittent light rain persisted until 24 July.

In Hong Kong 18 people were injured by falling objects. Advertising boards and scaffoldings were blown askew in Shamshuipo, Cheung Sha Wan, Tsim Sha Tsui, Mongkok, Kwun Tong and the Mid-Levels. Toppled trees were reported in Shek Kip Mei and Yuen Long. Two Vietnamese cargo ships ran aground off Stonecutters Island, but damage was slight. Ferry services to China and Macau were cancelled or suspended.

The rainfall distribution associated with Gary is shown in Figure 23. Information on wind, rainfall and tide during the passage of Gary is given as follows:

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

	Maximum Gust				*Maximum Hourly Wind*			
Station (see Fig. 1)	*Direction*	*Speed(km/h)*	*Date*	*Time*	*Direction*	*Speed(km/h)*	*Date*	*Time*
Royal Observatory	ENE	88	22 Jul	0210	E	41	22 Jul	1400
	E	88	22 Jul	0636				
Central	E	79	22 Jul	1149	ESE	41	22 Jul	1200
Cheung Chau	E	94	22 Jul	0613	E	54	22 Jul	0400
Green Island	E	112	22 Jul	1312	ENE	59	22 Jul	0500
					ENE	59	22 Jul	0600
H.K. Airport(SE)	E	92	22 Jul	1308	E	51	22 Jul	1400
H.K. Airport(NW)	ESE	103	22 Jul	1333	ESE	51	22 Jul	1300
King's Park	E	83	22 Jul	0548	ESE	38	22 Jul	1300
Kwai Chung	E	77	22 Jul	0747	ESE	31	22 Jul	1500
Lau Fau Shan	E	88	22 Jul	1230	E	47	22 Jul	1400
Sai Kung	E	85	22 Jul	0319	E	34	22 Jul	0300
Sha Tin	ENE	76	22 Jul	0445	ENE	22	22 Jul	0500

Station (see Fig. 1)	*Maximum Gust* Direction	Speed(km/h)	Date	Time	*Maximum Hourly Wind* Direction	Speed(km/h)	Date	Time
Star Ferry	E	88	22 Jul	1152	ESE	49	22 Jul	1700
Ta Kwu Ling	ESE	77	22 Jul	1355	ESE	34	22 Jul	1400
	ESE	77	22 Jul	1356				
Tate's Cairn	ESE	117	22 Jul	1158	E	75	22 Jul	1200
					ESE	75	22 Jul	1300
Tseun Kwan O	ENE	41	21 Jul	0154	NNE	13	21 Jul	1000
Tsing Yi	E	90	22 Jul	1013	E	41	22 Jul	0900
Tuen Mun	SSE	72	22 Jul	1409	SE	25	22 Jul	1700
Waglan Island	ESE	112	22 Jul	1200	ESE	79	22 Jul	1200
Wong Chuk Hang	ESE	101	22 Jul	1047	ENE	41	22 Jul	0500

Stations with incomplete record:
Tai Mo Shan
Tai Po Kau

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

Station (See Fig. 23)	*20 Jul*	*21 Jul*	*22 Jul*	*23 Jul*	*Total*
Royal Observatory	Nil	2.2	19.3	3.0	24.5
H09 (HK Island (east))	Nil	1.5	19.0	1.0	21.5
H11 (HK Island (west))	Nil	1.0	40.5	9.5	51.0
H15 (HK Island (south))	Nil	1.0	28.0	3.0	32.0
K04 (Kowloon (east))	Nil	2.0	31.0	6.0	39.0
K06 (Kowloon (west))	Nil	1.0	23.5	1.5	26.0
N17 (Lantau)	Nil	0.5	22.5	3.5	26.5
N05 (Sheung Shui—Sha Tau Kok)	Nil	1.0	25.0	18.5	44.5
N13 (Sai Kung)	Nil	1.5	13.0	4.0	18.5
N09 (Sha Tin)	Nil	2.0	39.0	13.0	54.0
R31 (Tai Po)	Nil	2.0	11.5	8.0	21.5
N06 (Tsuen Wan—Kwai Chung)	Nil	1.0	48.0	3.5	52.5
R21 (Tuen Mun)	Nil	1.0	32.0	3.0	33.0
R28 (Yuen Long)	Nil	1.0	41.0	7.0	49.0

Times and heights of the maximum sea level and 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
Chi Ma Wan	2.18	22 Jul	12.39 p.m.	0.67	22 Jul	12.39 p.m.
Ko Lau Wan	2.05	22 Jul	3.23 a.m.	0.59	22 Jul	10.42 a.m.
Quarry Bay	1.91	22 Jul	12.51 p.m.	0.49	22 Jul	11.08 a.m.
Tai Po Kau	2.07	22 Jul	3.50 a.m.	0.73	22 Jul	10.53 a.m.
Tsim Bei Tsui	2.17	22 Jul	2.47 p.m.	0.51	22 Jul	12.54 p.m.

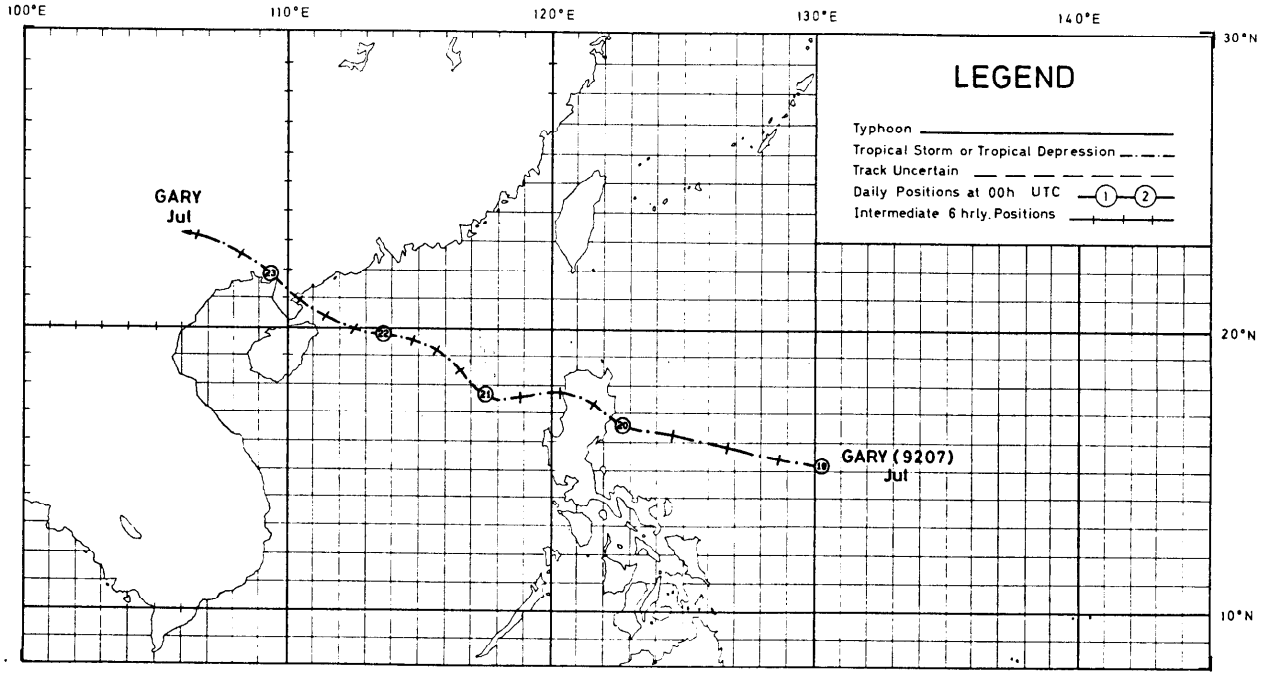


Figure 22. Track of Severe Tropical Storm Gary (9207): 19–23 July 1992.

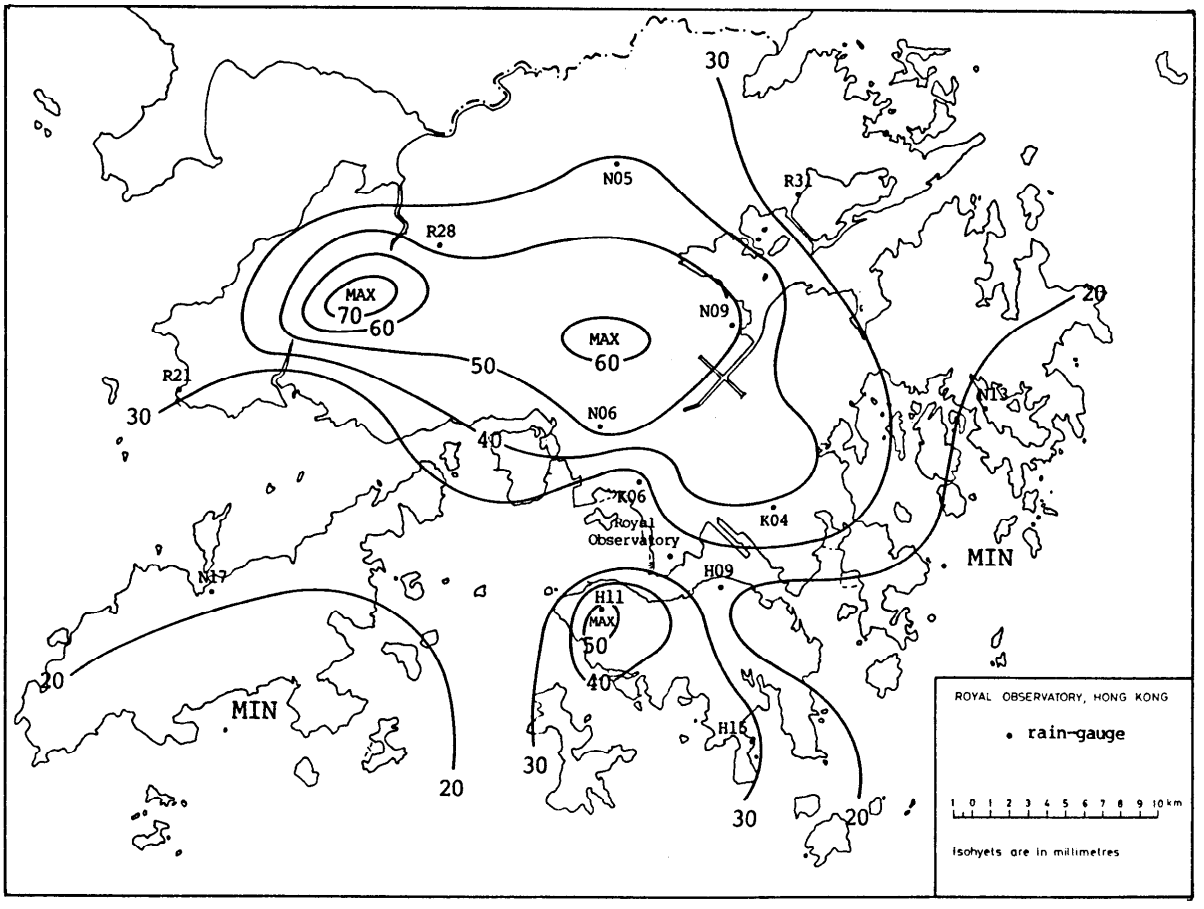


Figure 23. Rainfall (mm) distribution on 20–23 July 1992.

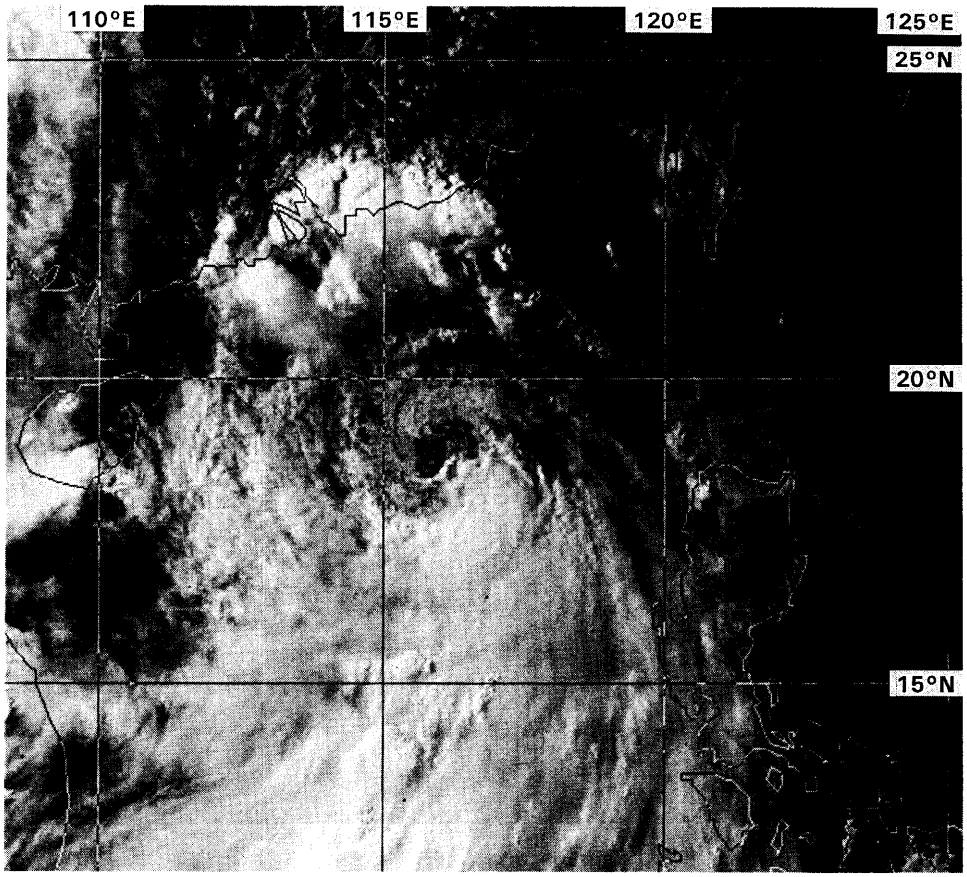


Figure 24. GMS-4 visible imagery of Gary at around 5 p.m. on 21 July 1992.

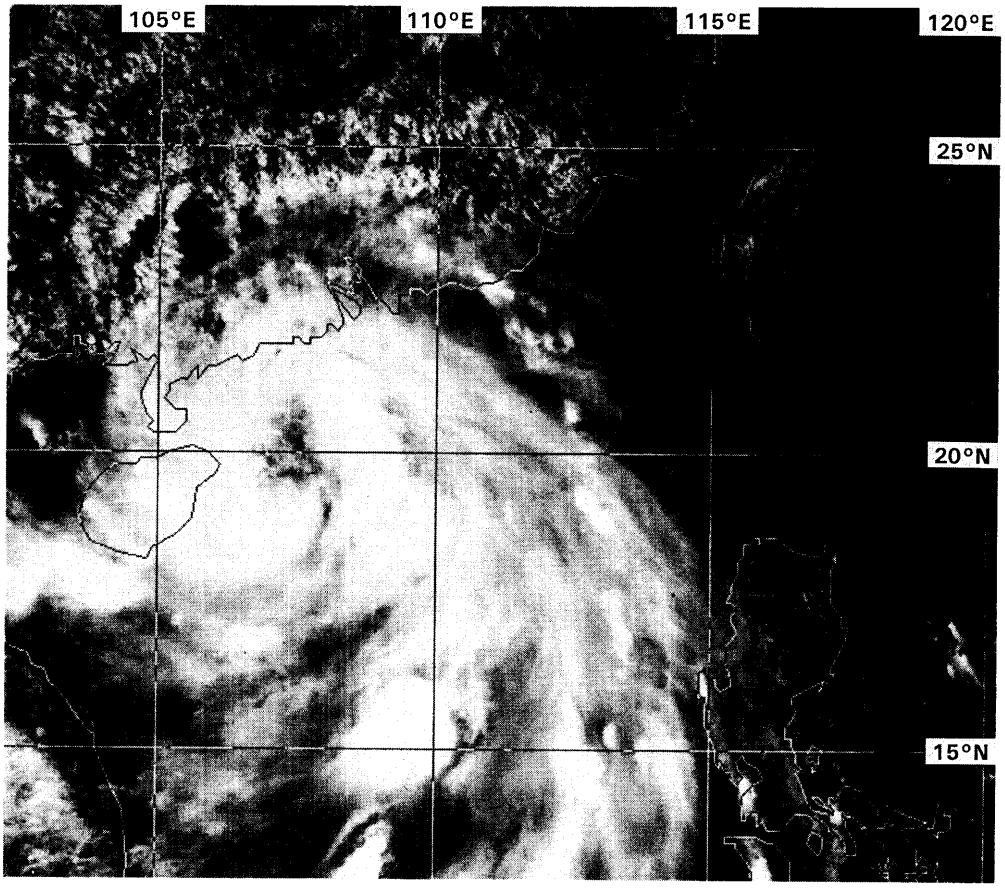


Figure 25. GMS-4 visible imagery of Gary at around 2 p.m. on 22 July 1992.

Figure 26. Two Vietnamese cargo ships aground off Stonecutters Island (by courtesy of Wah Kiu Yat Po).

版權照片刊登於印刷本內，該刊物可在香港天文台資源中心查閱。天文台資源中心地址：
香港九龍尖沙咀彌敦道 132 號
美麗華大廈 23 樓 2304-2309 室
〔電話：2926 8250〕

The copyrighted photo is available in the published version. The publication can be accessed at the Hong Kong Observatory Resource Centre located at :

Rooms 2304-2309, 23/F, Miramar Tower,
132 Nathan Road, Tsim Sha Tsui, Kowloon.
(Tel.: 2926 8250)

Figure 27. Loosened scaffoldings on Pratas Street, Cheung Sha Wan (by courtesy of Sing Tao Ltd.).

Figure 28. Advertisement signboards blown askew on Tonkin Street, Cheung Sha Wan (by courtesy of Wah Kiu Yat Po).

(e) Tropical Storm Mark (9212)

16-19 August 1992

The track of Mark is shown in Figure 29

Cloud clusters associated with an area of low pressure developed over the northeastern part of the South China Sea in mid August. From this area of disturbed weather, Tropical Depression Mark formed about 330 km east-southeast of Hong Kong on the morning of 16 August. It moved southwestwards initially at 9 km/h and made an anti-clockwise loop around the island of Dongsha during the day.

Mark headed northeastwards on the evening of 16 August and further intensified to a tropical storm about 390 km east of Hong Kong the next morning. Moving slowly at 8 km/h, it gradually turned towards the northwest during the night. Mark attained peak intensity on the morning of 18 August before weakening to a tropical depression that evening. It then re-intensified to a tropical storm just prior to landfall about 20 km northeast of Shantou on the morning of 19 August. Mark then turned south-southwestwards and weakened rapidly to an area of low pressure as it moved out to sea.

In eastern Guangdong, one person was killed and another was reported missing. Two people were injured. Heavy rain fell in the Shantou area. About 150 houses collapsed, 16 000 hectares of farmland and 1 000 hectares of fish ponds were inundated. The total loss was estimated at 67 million RMB.

In Hong Kong the Stand By Signal No. 1 was hoisted at 10.15 a.m. on 16 August soon after the formation of Tropical Depression Mark. At the time, Mark was about 320 km to the east-southeast. Winds in Hong Kong were moderate northerlies and the weather was hot. With Mark moving towards the coast of eastern Guangdong near Shantou, the Stand By Signal No. 1 was lowered at 11.30 a.m. on 17 August. At the time, Mark was about 400 km east of Hong Kong. The lowest sea-level pressure of 997.6 hPa was recorded at the Royal Observatory at 5 p.m. on 17 August. Mark made landfall near Shantou on 19 August and weakened to an area of low pressure over the coastal areas. Mark came closest to Hong Kong at 2 p.m. that afternoon before it weakened to an area of low pressure about 260 km to the east-northeast. But its remnant moved out to sea and drifted westwards along the coastal waters of Guangdong, passing about 60 km to the south of Hong Kong on 21 August. Winds turned easterly on the evening of 20 August and the weather was windy with some rain on the following day. Winds soon subsided on the morning of 22 August, but cloudy and showery conditions continued before fine weather returned on 25 August.

In Hong Kong, a few minor landslides occurred but no casualties were reported. Some ferry services to ports in southeastern China were cancelled.

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

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

	Maximum Gust				*Maximum Hourly Wind*			
Station (see Fig. 1)	*Direction*	*Speed(km/h)*	*Date*	*Time*	*Direction*	*Speed(km/h)*	*Date*	*Time*
Royal Observatory	NNE	34	16 Aug	2006	NE	16	16 Aug	1200
	ENE	34	16 Aug	2217	NNE	16	16 Aug	1300
Central	N	31	16 Aug	1050	N	16	16 Aug	1100
Cheung Chau	N	49	17 Aug	0727	NNW	30	17 Aug	0800
Green Island	NNE	38	16 Aug	1227	NW	27	17 Aug	1000
H.K. Airport(SE)	N	41	16 Aug	1957	N	22	16 Aug	2100
H.K. Airport(NW)	N	75	16 Aug	1916	NNE	30	16 Aug	2400
King's Park	NE	36	16 Aug	1047	NNE	14	16 Aug	1400
	N	36	16 Aug	1049				
	NE	36	16 Aug	1306				
Kwai Chung	N	31	16 Aug	1257	NNW	13	17 Aug	1000
Sai Kung	NW	41	16 Aug	1226	NW	20	16 Aug	1100
Sha Tin	NNW	36	17 Aug	0804	NNW	14	17 Aug	0800
Star Ferry	NNE	36	16 Aug	1445	W	20	17 Aug	0800
Ta Kwu Ling	NNE	40	16 Aug	1312	NNE	19	16 Aug	1100
Tai Mo Shan	NNE	62	16 Aug	1054	N	41	17 Aug	0200
Tai Po Kau	ENE	43	16 Aug	1448	N	16	16 Aug	2400
					WNW	16	17 Aug	1000
Tate's Cairn	NNE	75	16 Aug	2347	NNE	47	16 Aug	2300
Tseung Kwan O	N	41	17 Aug	0414	NNE	22	16 Aug	1100
Tsing Yi	NE	45	16 Aug	1057	N	16	16 Aug	1400
					N	16	16 Aug	1500
Tuen Mun	ESE	43	16 Aug	1512	NE	14	16 Aug	1100
Waglan Island	NNE	43	17 Aug	0946	NNE	31	17 Aug	0200
					NNE	31	17 Aug	0300
Wong Chuk Hang	NW	43	16 Aug	2057	NW	16	17 Aug	1100

Station with incomplete record:
Lau Fau Shan

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

Station (See Fig. 30)	*16 Aug*	*17 Aug*	*Total*
Royal Observatory	Trace	0.1	0.1
H09 (HK Island (east))	Nil	2.0	2.0
H11 (HK Island (west))	Nil	Nil	Nil
H21 (HK Island (south))	Nil	4.0	4.0
K04 (Kowloon (east))	Nil	Nil	Nil
K06 (Kowloon (west))	1.5	Nil	1.5
N17 (Lantau)	10.0	Nil	10.0
R24 (Sheung Shui—Sha Tau Kok)	2.0	Nil	2.0
N13 (Sai Kung)	Nil	3.0	3.0
N09 (Sha Tin)	Nil	Nil	Nil
R31 (Tai Po)	1.0	Nil	1.0
N11 (Tsuen Wan—Kwai Chung)	Nil	1.5	1.5
R21 (Tuen Mun)	0.5	Nil	0.5
N12 (Yuen Long)	Nil	Nil	Nil

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

Station (See Fig. 1)	Maximum sea level above chart datum			Maximum storm surge above astronomical tide		
	Height (m)	Date	Time	Height (m)	Date	Time
Ko Lau Wan	2.11	16 Aug	7.53 a.m.	0.35	17 Aug	7.49 p.m.
Lok On Pai	2.18	16 Aug	11.35 a.m.	0.16	17 Aug	7.50 a.m.
Quarry Bay	2.03	16 Aug	10.38 a.m.	0.23	17 Aug	8.02 p.m.
Tai Po Kau	2.11	16 Aug	7.55 a.m.	0.55	17 Aug	8.14 a.m.
Tsim Bei Tsui	2.46	16 Aug	10.54 a.m.	0.39	17 Aug	9.30 a.m.

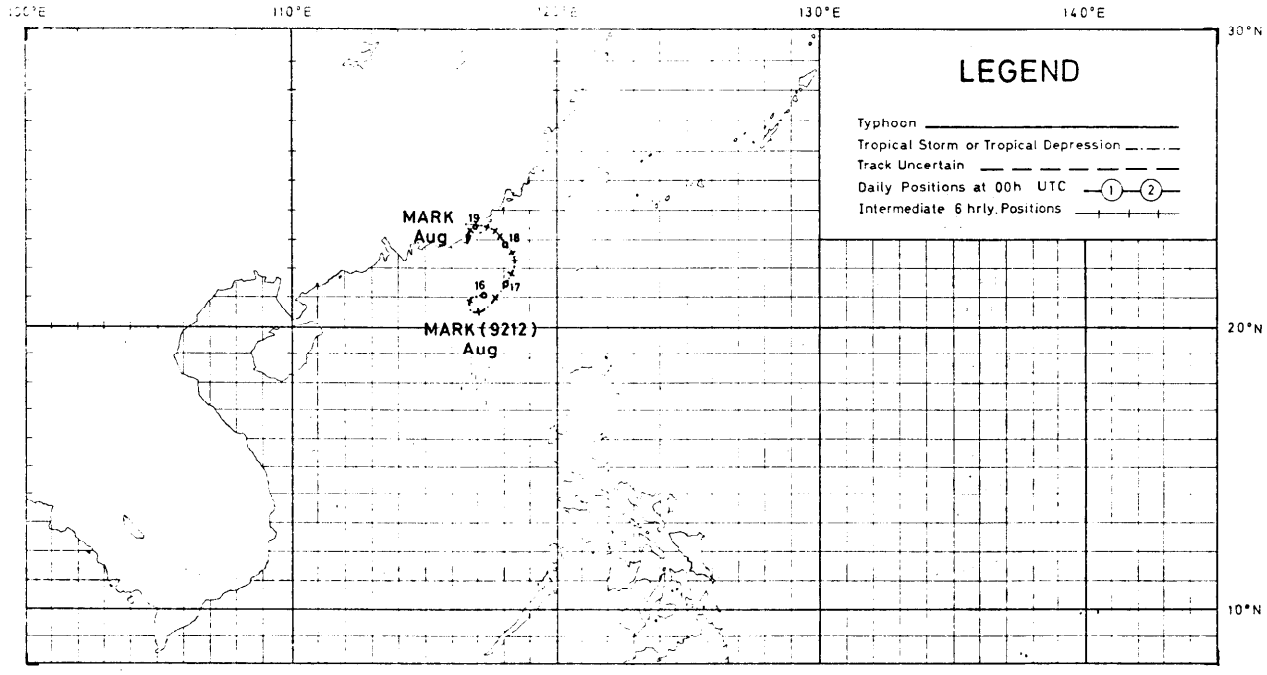


Figure 29. Track of Tropical Storm Mark (9212): 16–19 August 1992.

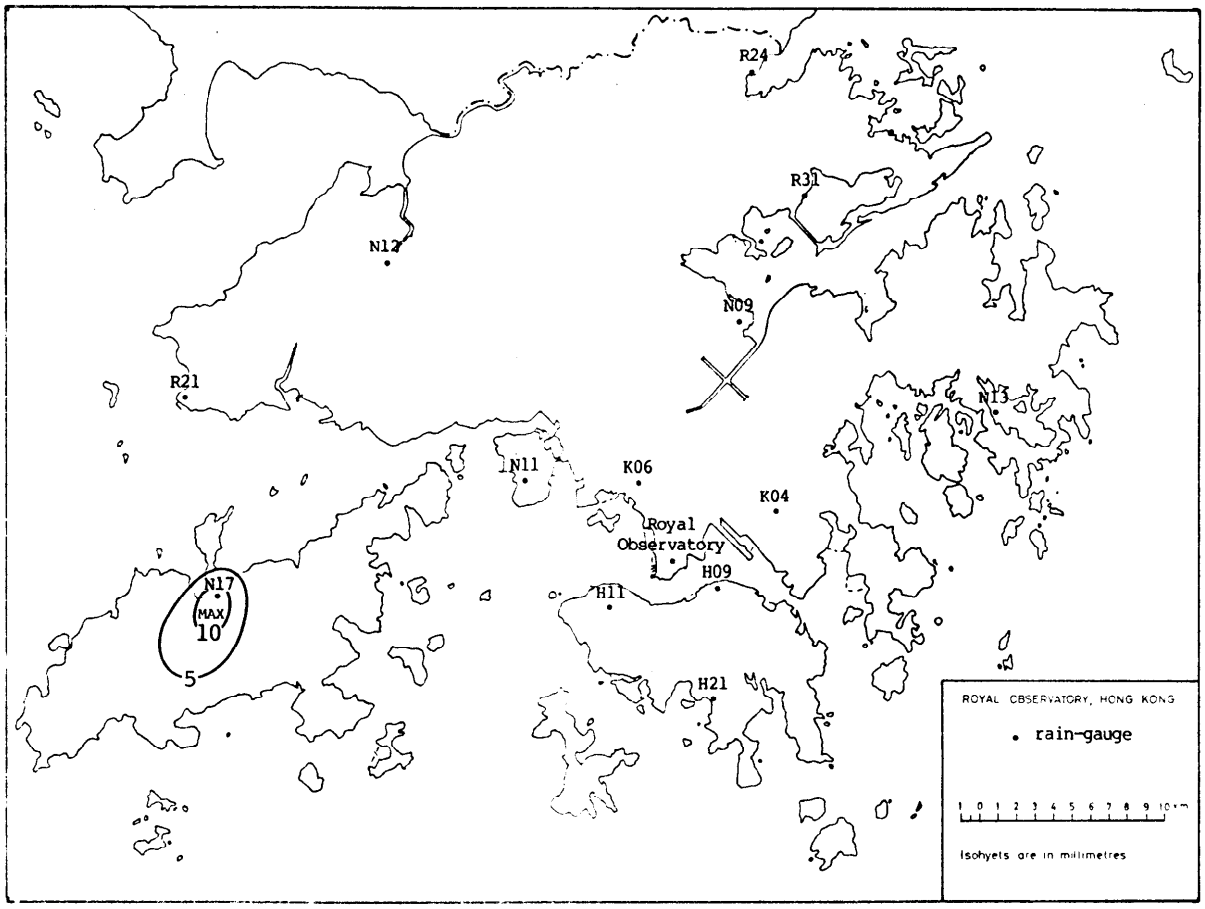


Figure 30. Rainfall (mm) distribution on 16–17 August 1992.

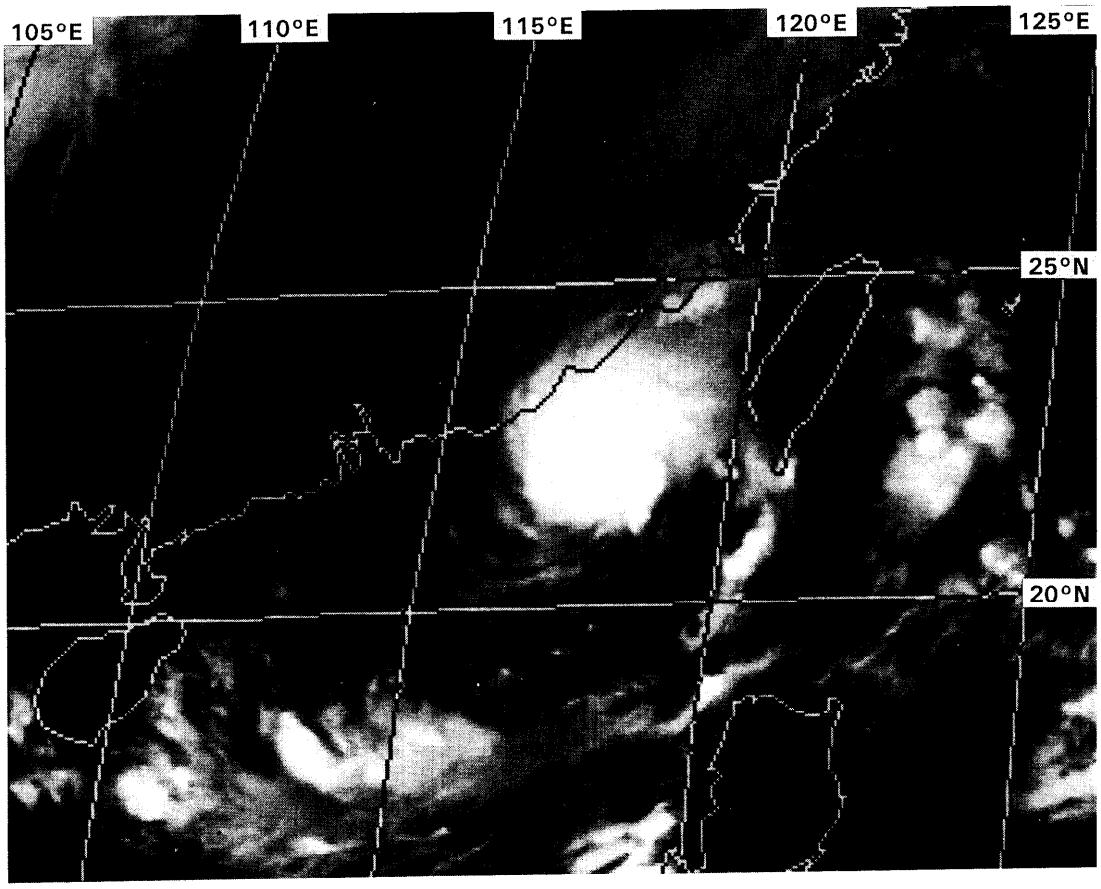


Figure 31. GMS-4 infra-red imagery of Mark at around 5 a.m. on 17 August 1992.

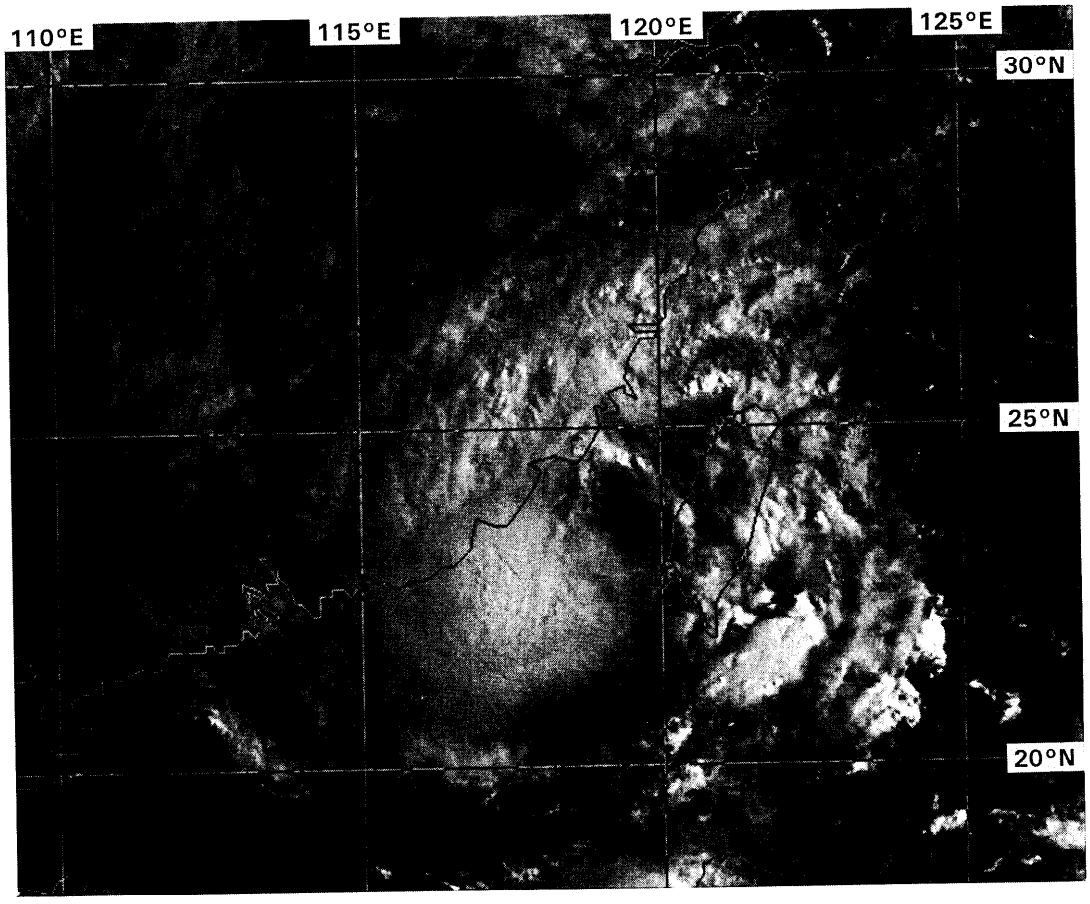


Figure 32. GMS-4 visible imagery of Mark at around 8 a.m. on 18 August 1992.

Section 4

TROPICAL CYCLONE STATISTICS AND TABLES

TABLE 1 is a list of tropical cyclones in 1992 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 cyclqne warnings for shipping issued by the Royal Observatory in 1992, 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 l0°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 1992. 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 1992 inclusive.

TABLE 5 gives the annual number of tropical cyclones in Hong Kong's area of responsibility between 1956 and 1992. 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 1956-1992.

TABLE 7 is a summary of meteorological information for each tropical cyclone affecting Hong Kong in 1992. 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 the Royal Observatory 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 1992 and highlights the 10 wettest tropical cyclones in Hong Kong for the period 1884-1939 and 1947-1992.

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 neareat 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 1992. The information is compiled from reports by 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 compiled from local newspaper reports and from the Marine Departments records.

Name of tropical cyclone		Beginning of track				End of track				Remark
		Date	Time UTC	Position °N	°E	Date	Time UTC	Position °N	°E	
Severe Tropical Storm Axel	(9201)	4 Jan	1800	5.7	179.0	10 Jan	0600	8.3	155.2	Dissipated
Tropical Depression Ekeka	(9202)	3 Feb	1800	9.4	179.8	4 Feb	0600	9.2	176.8	Dissipated
Typhoon Bobbie	(9203)	22 Jun	1200	10.2	133.4	29 Jun	1800	28.0	131.7	Became Extratropical
Typhoon Chuck	(9204)	24 Jun	0000	12.7	119.0	30 Jun	0600	22.6	104.8	Dissipated
Tropical Depression Deanna		28 Jun	1200	6.5	140.7	2 Jul	0600	19.5	127.7	Dissipated
Typhoon Eli	(9205)	9 Jul	0600	12.6	134.9	14 Jul	0000	21.9	105.5	Dissipated
Tropical Storm Faye	(9206)	17 Jul	0000	20.1	114.1	18 Jul	1200	23.6	114.6	Dissipated
Severe Tropical Storm Gary	(9207)	19 Jul	0000	15.1	130.1	23 Jul	1200	23.1	106.6	Dissipated
Severe Tropical Storm Helen	(9208)	24 Jul	1800	23.7	161.8	27 Jul	1800	35.5	159.9	Became Extratropical
Severe Tropical Storm Irving	(9209)	1 Aug	1800	25.5	131.1	4 Aug	0600	33.3	132.3	Dissipated
Typhoon Janis	(9210)	2 Aug	1800	10.3	146.7	8 Aug	1200	35.7	133.6	Became Extratropical
Typhoon Kent	(9211)	5 Aug	0000	9.5	172.1	18 Aug	0600	31.6	131.9	Dissipated
Tropical Depression Lois	(9214)	14 Aug	0600	14.8	128.1	19 Aug	1800	27.1	140.5	Dissipated
Tropical Storm Mark	(9212)	16 Aug	0000	21.1	117.1	19 Aug	0600	23.3	116.5	Dissipated
Tropical Storm Nina	(9213)	17 Aug	1200	23.8	161.2	21 Aug	0000	39.5	161.8	Became Extratropical
Typhoon Omar	(9215)	24 Aug	1200	8.9	154.7	5 Sep	1200	24.2	116.8	Dissipated
Tropical Depression Polly(I)	(9216)	26 Aug	0600	19.2	134.5	27 Aug	0600	21.4	133.2	Dissipated
Tropical Depression Polly(II)	(9216)	27 Aug	0600	23.2	125.8	28 Aug	0000	22.5	124.5	Dissipated
Tropical Storm Polly(III)	(9216)	29 Aug	0600	22.8	123.4	31 Aug	0600	25.8	118.8	Dissipated
Typhoon Ryan	(9217)	31 Aug	1800	16.1	149.2	11 Sep	0600	39.9	146.4	Became Extratropical
Typhoon Sibyl	(9218)	7 Sep	0600	20.6	166.4	14 Sep	1800	36.6	158.1	Became Extratropical
Severe Tropical Storm Ted	(9219)	18 Sep	0000	15.1	137.0	23 Sep	1200	30.8	120.6	Became Extratropical
Tropical Storm Val	(9220)	24 Sep	0600	18.1	156.4	27 Sep	0000	33.9	149.6	Became Extratropical
Typhoon Ward	(9221)	25 Sep	1200	12.0	186.2	6 Oct	1200	38.5	161.6	Became Extratropical
Typhoon Yvette	(9222)	8 Oct	0000	15.5	130.5	17 Oct	0600	29.4	141.3	Became Extratropical
Tropical Depression Zack	(9223)	10 Oct	1200	13.7	163.7	11 Oct	1200	18.6	160.8	Dissipated
Typhoon Angela	(9224)	16 Oct	1800	13.3	118.7	23 Oct	1800	12.5	107.5	Dissipated
Typhoon Brian	(9225)	17 Oct	1200	10.9	157.2	24 Oct	1200	27.9	139.0	Dissipated
Typhoon Colleen	(9226)	18 Oct	1200	11.7	130.9	28 Oct	1800	15.0	105.4	Dissipated
Typhoon Dan	(9227)	23 Oct	1200	10.9	188.5	3 Nov	1800	30.9	159.1	Dissipated
Typhoon Elsie	(9228)	29 Oct	0600	7.8	151.0	6 Nov	1800	27.9	137.1	Became Extratropical
Typhoon Forrest	(9229)	13 Nov	0000	8.4	112.1	21 Nov	1200	20.0	92.5	Dissipated
Typhoon Gay	(9230)	15 Nov	0000	7.0	174.8	29 Nov	0600	23.2	129.7	Dissipated
Typhoon Hunt	(9231)	16 Nov	0600	12.7	155.7	21 Nov	1200	30.7	151.7	Became Extratropical

TABLE 2. TROPICAL CYCLONE WARNINGS FOR SHIPPING ISSUED IN 1992

Tropical cyclone	No. of warnings issued	Date and time[+] of issue of		Duration of warnings (hours)
		First warning	Last warning	
*Typhoon Chuck	42	25 Jun 0000	30 Jun 0300	123
Typhoon Bobbie	16	26 Jun 1200	28 Jun 0900	45
*Typhoon Eli	27	10 Jul 1800	13 Jul 2100	75
*Tropical Storm Faye	13	17 Jul 0000	18 Jul 0900	33
*Severe Tropical Storm Gary	30	19 Jul 2100	23 Jul 1200	87
*Tropical Storm Mark	29	16 Aug 0000	19 Aug 1200	84
	5	19 Aug 1800	20 Aug 0600	12
Tropical Storm Polly(III)	32	28 Aug 0000	31 Aug 2100	93
Typhoon Omar	18	3 Sep 1500	5 Sep 1800	51
Severe Tropical Storm Ted	26	20 Sep 0600	23 Sep 0900	75
Typhoon Angela	63	16 Oct 0600	24 Oct 0000	186
Typhoon Colleen	29	25 Oct 0900	28 Oct 2100	84
Total	330			948

* Tropical cyclones for which tropical cyclone warning signals were hoisted in H.K.
[+] Times are given in hours UTC

TABLE 3. TROPICAL CYCLONE WARNING SIGNALS HOISTED IN HONG KONG AND NUMBER OF WARNING BULLETINS ISSUED IN 1992

SUMMARY

Signal	No. of occasions	Total duration
1	5	82 h 15 min
3	5	74 h 20 min
8 NORTHWEST	-	-
8 SOUTHWEST	-	-
8 NORTHEAST	1	5 h 15 min
8 SOUTHEAST	1	5 h 15 min
9	-	-
10	-	-
Total	12	167 h 5 min

DETAILS

Tropical cyclone	No. of warning bulletins issued	Signal	Hoisted Date Time*	Lowered Date Time*
Typhoon Chuck	31	1	27 Jun 0850	27 Jun 2015
		3	27 Jun 2015	28 Jun 1400
Typhoon Eli	39	1	11 Jul 2030	12 Jul 1000
		3	12 Jul 1000	13 Jul 0945
Tropical Storm Faye	31	1	17 Jul 0900	17 Jul 2350
		3	17 Jul 2350	18 Jul 1605
Severe Tropical Storm Gary	45	1	20 Jul 2230	21 Jul 1545
		3	21 Jul 1545	22 Jul 0545
		8 NE	22 Jul 0545	22 Jul 1100
		8 SE	22 Jul 1100	22 Jul 1615
		3	22 Jul 1615	22 Jul 1850
Tropical Storm Mark	27	1	16 Aug 1015	17 Aug 1130

* Hong Kong Time (UTC + 8)

TABLE 4. FREQUENCY AND TOTAL DURATION OF DISPLAY OF TROPICAL CYCLONE WARNING SIGNALS : 1956-1992

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
Total	245	221	11	18	44	31	13	11	10525	9
Mean	6.6	6.0	0.3	0.5	1.2	0.8	0.4	0.3	284	28

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 - 1992

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
Total	603	231
Mean	16.3	6.2

TABLE 6. DURATION OF TROPICAL CYCLONE WARNING SIGNALS HOISTED IN HONG KONG : 1956-1992

Signal hoisted	Number of occasions	Duration of each occasion			Total duration per year		
		Mean	Maximum	Minimum	Mean	Maximum	Minimum
		h min	h min	h min	h min	h min	h min
1 or higher	241	43 40	161 0	9 35	284 27	570 15	36 35
3 or higher	171	31 26	124 15	6 55	145 14	306 35	23 55
8 or higher	52	17 0	66 50	2 40	23 54	100 55	0 0
8 NW	11	6 51	15 45	1 30	2 2	15 45	0 0
8 SW	18	5 17	10 45	2 30	2 34	16 10	0 0
8 NE	44	8 40	35 35	2 35	10 18	40 20	0 0
8 SE	31	7 26	21 45	0 20	6 14	31 15	0 0
9 or higher	14	7 18	11 33	3 35	2 46	19 25	0 0
10	11	6 10	9 10	2 30	1 50	12 10	0 0

TABLE 7. A SUMMARY OF METEOROLOGICAL OBSERVATIONS RECORDED IN HONG KONG DURING THE PASSAGES OF TROPICAL CYCLONES IN 1992

(a)

Name of tropical cyclone	Month	Nearest approach to Hong Kong						Minimum 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
T. Chuck	Jun	28	2	SW	600	NW 16	960	Jun	27	16	999.0	-	0.69	0.54	0.55	0.62	0.68	0.65	-
T. Eli	Jul	13	5	SW	480	WNW 27	975	Jul	13	4	1008.9	0.37	0.33	0.32	0.28	0.27	0.41	0.38	-
T.S Faye	Jul	18	9	WNW	50	NNE 13	995	Jul	18	06,07	1003.6	0.37	0.28	0.44	0.25	-	0.45	0.75	-
S.T.S. Gray	Jul	22	7	S	290	W 19	975	Jul	22	14	1002.4	0.67	0.59	-	0.49	-	0.73	0.51	-
T.S. Mark	Aug	19	14	ENE	260	SSW 7	995	Aug	17	17	997.6	-	0.35	0.16	0.23	-	0.55	0.39	-

*** Hong Kong Time (UTC + 8)**

(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		
		Royal Observatory	King's Park	Waglan Island	Royal Observatory	King's Park	Waglan Island	Royal Observatory	King's Park	Waglan Island
T. Chuck	Jun	E 31	E 22	E 77	E 36	ESE 27	E 79	E, ENE 65	E 62	ESE 104
T. Eli	Jul	E 30	SE, ESE 23	ESE 58	E 27	SE, ESE 27	ESE 67	E 59	SE, ESE 56	E 90
T.S. Faye	Jul	S 40	S 38	SSW 96	S 36	S 45	SSW 108	S 92	SSE 94	S 135
S.T.S. Gary	Jul	E 41	ESE 38	ESE 81	E 40	ESE 43	ESE 87	ENE, E 88	E 83	ESE 112
T.S. Mark	Aug	NNE 19	NNE 16	NNE 31	NE, NNE 16	NNE 20	NNE 34	NNE, ENE 34	N, NE 36	NNE 43

*Hong Kong Time (UTC + 8)

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 1992.

Name of tropical cyclone	Period* when tropical cyclone within 600 km of Hong Kong (T_1 ▸ T_2)	Rainfall at the Royal Observatory (mm)				
		(i) 600 km (T_1▸T_2)	(ii) 24 hours after T_2	(iii) 48 hours after T_2	(iv) 72 hours after T_2	(i) + (iv) Total T_1▸(T_2+72 hours)
T. Chuck	Outside 600 km					
T. Eli	(T1) 12 Jul 1400 – (T2) 13 Jul 1300	28.4	8.5	8.5	8.5	36.9
T.S. Faye	(T1) 17 Jul 0800 – (T2) 18 Jul 2000	184.4	NIL	NIL	2.2+	186.6
S.T.S. Gary	(T1) 21 Jul 1100 – (T2) 23 Jul 1200	24.5+	Trace	Trace	Trace	24.5
T.S. Mark	(T1) 16 Aug 0800 – (T2) 19 Aug 1400	0.1	NIL	12.7	26.6	26.7
T. Omar #	(T1) 5 Sep 1400 – (T2) 5 Sep 2000	Trace	29.5	7.4	12.2	49.1

N.B. # Tropical cyclone without hoisting of tropical cyclone warning signals.
* Hour in Hong Kong Time (UTC + 8)
+ 2.2 mm rainfall of T.S. Faye in column (iv) overlapped with S.T.S. Gary's rainfall in column (i)

(b). THE 10 WETTEST TROPICAL CYCLONES IN HONG KONG (1884-1939, 1947-1992)

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
1982	Aug	Dot	41.2	322.5	403.1	450.5	491.7
*1904	Aug	-	446.5	Nil	3.7	26.7	473.2
1974	Oct	Carmen	307.6	150.3	161.7	162.1	469.7
*1960	Jun	Mary	427.5	Nil	2.6	13.3	440.8
1989	May	Brenda	410.2	22.5	22.9	29.4	439.6

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 1946-1992

Name of typhoon	Date	Nearest approach to Royal Observatory (km)	Minimum M.S.L. pressure (hPa) Hourly	Inst.	Maximum 60-min mean wind in points and km/h: Royal Observatory	Hong Kong Airport	Waglan Island	Cheung Chau	Tate's Cairn	Cape Collinson	Green Island	Castle Peak	Maximum gust peak speed in km/h with direction in points: Royal Observatory	Hong Kong Airport	Waglan Island	Cheung Chau	Tate's Cairn	Cape Collinson	Green Island	Castle Peak
-	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	NNW 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	SSE 153	-	-	NNE 227	NW 203	E 230	NNE 216	E 268	S 221	-	-
Dot	13 Oct 1964	E 35	978.9	977.3	NNW 88	N 67	N 117	NNW 96	NNE 157	N 101	-	-	N 175	N 198	N 184	WNW 205	NE 220	NNE 187	-	-
Shirley	21 Aug 1968	0	968.7	968.6	N 68	N 75	NNE 124	SSW 90	NNE 126	SSW 85	-	-	N 133	N 151	NE 209	SSW 167	NNE 203	N 173	-	-
Rose	17 Aug 1971	WSW 20	984.5	982.8	SE 103	SE 122	ESE 140	SE 131	S 148	SSW 137	-	-	ESE 224	ESE 211	ESE 189	SE 194	S 221	S 191	-	-
Elsie	14 Oct 1975	S 50	996.4	996.2	ENE 58	NNW 67	NNE 118	N 106	NE 130	-	NNW 118	N 65	NE 140	N 140	ENE 176	NE 158	NNE 180	-	NE 167	N 121
Hope	2 Aug 1979	NNW 10	961.8	961.6	W 75	W 115	SW 144	SSW 117	NW 115	-	W 108	- 96	W 175	WNW 182	SW 198	WSW 185	WNW 229	-	W 167	- 173
Ellen	9 Sep 1983	SW 45	983.9	983.1	E 92	E 112	ESE 169	ESE 171	E 126	-	S 137	SE 94	E 185	E 203	E 227	SSE 238	ENE 218	-	S 220*	SE 171

* estimated, exceeding upper limit of anemogram

TABLE 10. DAMAGE CAUSED BY TROPICAL CYCLONES IN HONG KONG, 1992

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
T. Chuck	Jun	-	pier: 1 site	-	-	-	-	0.2	-	-	-	0.2
T.S. Faye	Jul	farmland: 512 hectares crops: 1000 tonnes livestock: 20800 heads pond fish: 100 tonnes	bridge: 1 site pier: 1 site	-	78 units	40 cases	8.0	1.3	5.3	-	-	14.6
S.T.S. Gary	Jul				5 units				0.3			0.3

TABLE 11. CASUALTIES AND DAMAGE CAUSED BY TROPICAL CYCLONES IN HONG KONG : 1963-1992

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
1963	1 - 9 Sep	T. Faye	0	2	0	3	0	51
1964	26 - 28 May	T. Viola	5	18	18	0	0	41
	2 - 9 Aug	T. Ida	3	7	60	5	4	56
	2 - 6 Sep	T. Ruby	20	32	282	38	6	300
	4 - 10 Sep	T. Sally	0	0	0	9	0	24
	7 - 13 Oct	T. Dot	2	31	59	26	10	85
1965	6 - 16 Jul	T. Freda	0	1	0	2	0	16
	25 - 28 Sep	T.S. Agnes	0	0	0	5	0	3
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 +	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	34	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

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
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
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 +
	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

N.B. Information supplies by relevant government departments and public utility companies. Damages reports in the local press were also examined and collated.

* Data unavailable

\+ Struck by lightning

Section 5

TROPICAL CYCLONE POSITION AND INTENSITY DATA, 1992

Six-hourly position and intensity data are tabulated for the following tropical cyclones in 1992 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°).

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 SEVERE TROPICAL STORM AXEL (9201)

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hpa)	Estimated maximum surface winds (m/s)	Lat. °E	Long. °N
Jan	4	1800	T.D.	1000	13	5.7	179.0
	5	0000	T.D.	1000	13	5.7	178.4
		0600	T.D.	1000	16	5.8	177.8
		1200	T.S.	995	18	5.9	177.1
		1800	T.S.	995	21	6.0	176.4
	6	0000	T.S.	990	23	6.1	175.7
		0600	T.S.	990	23	6.2	174.9
		1200	S.T.S.	985	25	6.2	174.0
		1800	S.T.S.	980	28	6.0	173.0
	7	0000	S.T.S.	975	31	5.8	171.9
		0600	S.T.S.	980	28	5.8	170.8
		1200	T.S.	990	23	6.2	169.8
		1800	T.S.	995	18	6.5	168.7
	8	0000	T.S.	995	18	6.6	167.6
		0600	T.S.	990	21	6.4	166.4
		1200	T.S.	990	21	6.2	165.2
		1800	T.S.	985	23	6.1	163.7
	9	0000	S.T.S.	980	25	6.3	162.2
		0600	S.T.S.	980	25	6.7	160.5
		1200	T.S.	985	23	7.1	159.0
		1800	T.S.	990	18	7.4	157.6
	10	0000	T.D.	995	16	7.9	156.2
		0600	T.D.	1000	13	8.3	155.2

Dissipated

SIX-HOURLY POSITION AND INTENSITY DATA OF TROPICAL DEPRESSION EKEKA (9202)

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °E	Long. °N
Feb	3	1800	T.D.	995	16	9.4	179.8
	4	0000	T.D.	995	16	9.3	178.2
		0600	T.D.	1000	13	9.2	176.8

Dissipated

SIX-HOURLY POSITION AND INTENSITY DATA OF TYPHOON BOBBIE (9203)

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °N	Long. °E
Jun	22	1200	T.D.	1000	13	10.2	133.4
		1800	T.D.	1000	13	10.3	133.0
	23	0000	T.D.	1000	13	10.5	132.6
		0600	T.D.	995	16	10.7	132.2
		1200	T.S.	990	18	10.9	131.8
		1800	T.S.	990	18	11.1	131.5
	24	0000	T.S.	990	21	11.3	131.1
		0600	T.S.	990	21	11.6	130.8
		1200	T.S.	990	21	12.0	130.3
		1800	T.S.	990	21	12.6	129.8
	25	0000	T.S.	985	23	13.3	129.1
		0600	S.T.S.	980	28	14.1	128.5
		1200	T.	970	33	14.9	127.8
		1800	T.	970	33	15.8	126.9
	26	0000	T.	965	36	16.6	126.2
		0600	T.	960	39	17.4	125.5
		1200	T.	955	41	18.2	124.9
		1800	T.	950	43	19.1	124.4
	27	0000	T.	955	41	20.1	124.3
		0600	T.	955	39	21.0	124.0
		1200	T.	955	39	21.9	123.9
		1800	T.	960	36	22.7	124.1
	28	0000	T.	960	36	23.6	124.2
		0600	T.	960	39	24.2	124.7
		1200	T.	960	39	24.8	125.6
		1800	T.	965	36	25.4	126.6
	29	0000	T.	965	36	25.9	127.8
		0600	S.T.S.	970	31	26.5	129.0
		1200	S.T.S.	975	28	27.2	130.4
		1800	S.T.S.	975	28	28.0	131.7

Became Extratropical

SIX-HOURLY POSITION AND INTENSITY DATA OF TYPHOON CHUCK (9204)

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °E	Long. °N
Jun	24	0000	T.D.	995	13	12.7	119.0
		0600	T.D.	995	13	13.0	118.2
		1200	T.D.	995	13	13.5	117.3
		1800	T.D.	995	16	13.9	116.5
	25	0000	T.S.	990	18	14.2	115.7
		0600	T.S.	985	21	14.3	115.3
		1200	T.S.	980	23	14.3	114.9
		1800	S.T.S.	980	25	14.4	114.5
	26	0000	S.T.S.	975	28	14.6	114.1
		0600	S.T.S.	975	28	14.9	113.7
		1200	S.T.S.	975	28	15.3	113.3
		1800	S.T.S.	970	31	15.7	112.9
	27	0000	T.	965	33	16.2	112.5
		0600	T.	965	33	16.7	112.1
		1200	T.	960	36	17.3	111.5
		1800	T.	960	36	17.9	110.8
	28	0000	T.	960	36	18.4	110.0
		0600	T.	960	36	18.7	109.3
		1200	T.	965	33	19.0	108.7
		1800	T.	970	33	19.4	108.1
	29	0000	T.	960	36	19.9	107.6
		0600	T.	960	36	20.4	107.1
		1200	T.	970	33	20.9	106.6
		1800	S.T.S.	980	28	21.4	105.9
	30	0000	T.S.	990	21	21.9	105.1
		0600	T.D.	995	13	22.6	104.8

Dissipated

SIX-HOURLY POSITION AND INTENSITY DATA OF TROPICAL DEPRESSION DEANNA

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °E	Long. °N
Jun	28	1200	T.D.	1000	13	6.5	140.7
		1800	T.D.	997	16	7.1	139.9
	29	0000	T.D.	997	16	7.9	138.9
		0600	T.D.	997	16	8.7	138.0
		1200	T.D.	997	16	9.5	137.1
		1800	T.D.	997	16	10.2	136.3
	30	0000	T.D.	997	16	11.0	135.3
		0600	T.D.	997	16	11.8	134.4
		1200	T.D.	1000	13	12.6	133.5
		1800	T.D.	1000	13	13.4	132.5
Jul	1	0000	T.D.	1000	13	14.2	131.6
		0600	T.D.	1000	13	15.1	130.5
		1200	T.D.	1000	13	16.0	129.5
		1800	T.D.	1000	13	17.0	128.6
	2	0000	T.D.	1000	13	18.1	127.8
		0600	T.D.	1000	13	19.5	127.7

Dissipated

SIX-HOURLY POSITION AND INTENSITY DATA OF TYPHOON ELI (9205)

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °E	Long. °N
Jul	9	0600	T.D.	1000	13	12.6	134.9
		1200	T.D.	1000	16	12.8	133.2
		1800	T.S.	995	18	13.6	131.6
	10	0000	T.S.	990	23	14.2	130.0
		0600	S.T.S.	985	25	14.6	128.3
		1200	S.T.S.	980	28	15.0	126.6
		1800	S.T.S.	980	31	15.3	124.6
	11	0000	T.	975	33	15.6	122.4
		0600	S.T.S.	980	31	16.2	120.5
		1200	S.T.S.	980	28	16.9	118.6
		1800	S.T.S.	980	28	16.9	116.9
	12	0000	S.T.S.	980	31	16.9	115.5
		0600	S.T.S.	980	31	17.2	114.3
		1200	S.T.S.	980	31	17.7	113.2
		1800	T.	975	33	18.5	111.9
	13	0000	T.	975	33	19.3	110.6
		0600	S.T.S.	980	31	20.0	109.2
		1200	S.T.S.	985	28	20.7	107.8
		1800	T.S.	990	21	21.5	106.6
	14	0000	T.D.	995	16	21.9	105.5

Dissipated

SIX-HOURLY POSITION AND INTENSITY DATA OF TROPICAL STORM FAYE (9206)

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °E	Long. °N
Jul	17	0000	T.D.	1002	13	20.1	114.1
		0600	T.D.	1000	16	20.7	114.1
		1200	T.S.	998	18	21.3	113.9
		1800	T.S.	997	21	21.8	113.5
	18	0000	T.S.	995	23	22.4	113.7
		0600	T.S.	997	21	23.0	114.1
		1200	T.D.	1000	13	23.6	114.6

Dissipated

SIX-HOURLY POSITION AND INTENSITY DATA OF SEVERE TROPICAL STORM GARY (9207)

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °E	Long. °N
Jul	19	0000	T.D.	1000	13	15.1	130.1
		0600	T.D.	1000	13	15.4	128.5
		1200	T.D.	1000	13	15.8	126.6
		1800	T.D.	995	16	16.2	124.4
	20	0000	T.D.	995	16	16.6	122.6
		0600	T.D.	995	16	17.3	121.5
		1200	T.S.	990	18	17.8	120.2
		1800	T.S.	985	21	17.6	118.8
	21	0000	S.T.S.	980	25	17.7	117.4
		0600	T.S.	985	23	18.4	116.5
		1200	T.S.	985	23	19.1	115.6
		1800	S.T.S.	980	25	19.5	114.7
	22	0000	S.T.S.	975	28	19.7	113.6
		0600	S.T.S.	975	28	19.9	112.5
		1200	S.T.S.	975	28	20.3	111.4
		1800	S.T.S.	980	25	20.9	110.4
	23	0000	T.S.	985	21	21.8	109.4
		0600	T.S.	985	21	22.5	108.2
		1200	T.D.	990	16	23.1	106.6

Dissipated

SIX-HOURLY POSITION AND INTENSITY DATA OF SEVERE TROPICAL STORM HELEN (9208)

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °E	Long. °N
Jul	24	1800	T.D.	1000	13	23.7	161.8
	25	0000	T.D.	1000	13	23.9	161.0
		0600	T.D.	1000	13	24.2	160.3
		1200	T.D.	995	16	24.6	159.6
		1800	T.S.	990	21	25.0	159.0
	26	0000	S.T.S.	980	25	25.5	158.5
		0600	S.T.S.	980	25	26.5	158.2
		1200	T.S.	985	23	27.8	158.1
		1800	T.S.	990	21	29.1	158.1
	27	0000	T.S.	990	21	30.4	158.1
		0600	T.S.	995	18	32.0	158.3
		1200	T.D.	1000	16	33.8	159.0
		1800	T.D.	1000	16	35.5	159.9

Became Extratropical

SIX-HOURLY POSITION AND INTENSITY DATA OF SEVERE TROPICAL STORM IRVING (9209)

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °E	Long. °N
Aug	1	1800	T.D.	1000	13	25.5	131.1
	2	0000	T.D.	1000	16	26.1	131.3
		0600	T.S.	995	18	26.7	131.5
		1200	T.S.	990	21	27.2	131.7
		1800	T.S.	990	21	27.8	132.0
	3	0000	S.T.S.	980	25	28.5	132.5
		0600	S.T.S.	975	28	29.4	133.1
		1200	S.T.S.	980	25	30.2	133.8
		1800	T.S.	980	23	31.1	134.4
	4	0000	T.D.	985	16	32.3	133.9
		0600	T.D.	990	13	33.3	132.3

Dissipated

SIX-HOURLY POSITION AND INTENSITY DATA OF TYPHOON JANIS (9210)

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °E	Long. °N
Aug	2	1800	T.D.	1000	13	10.3	146.7
	3	0000	T.D.	1000	16	11.3	145.6
		0600	T.D.	1000	16	12.3	144.6
		1200	T.S.	995	18	13.2	143.6
		1800	T.S.	990	21	14.2	142.6
	4	0000	T.S.	985	23	15.1	141.7
		0600	T.S.	985	23	16.0	140.7
		1200	S.T.S.	980	25	16.9	139.7
		1800	S.T.S.	975	28	17.7	138.7
	5	0000	T.	965	33	18.4	137.6
		0600	T.	955	39	19.1	136.5
		1200	T.	950	41	19.8	135.3
		1800	T.	950	41	20.7	134.1
	6	0000	T.	950	41	21.7	133.1
		0600	T.	950	41	22.9	132.1
		1200	T.	940	46	24.1	131.1
		1800	T.	945	43	25.3	130.2
	7	0000	T.	955	39	26.6	129.6
		0600	T.	955	39	28.0	129.3
		1200	T.	960	36	29.4	129.2
		1800	S.T.S.	965	31	30.9	129.6
	8	0000	S.T.S.	970	25	32.5	130.5
		0600	T.S.	980	21	34.0	131.4
		1200	T.D.	985	16	35.7	133.6

Became Extratropical

SIX-HOURLY POSITION AND INTENSITY DATA OF TYPHOON KENT (9211)

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °E	Long. °N
Aug	5	0000	T.D.	1000	13	9.5	172.1
		0600	T.D.	1000	13	9.8	171.3
		1200	T.D.	995	16	10.2	170.5
		1800	T.S.	990	18	10.7	169.6
	6	0000	T.S.	985	21	11.2	168.7
		0600	T.S.	980	23	11.7	167.9
		1200	S.T.S.	975	25	12.2	166.9
		1800	S.T.S.	975	25	12.7	165.8
	7	0000	S.T.S.	975	25	13.3	164.7
		0600	T.S.	980	23	13.9	163.5
		1200	T.S.	980	23	14.5	162.5
		1800	T.S.	980	23	15.1	161.6
	8	0000	T.S.	985	21	15.9	160.7
		0600	T.S.	985	21	16.6	159.7
		1200	T.S.	985	21	17.1	158.6
		1800	T.S.	980	23	17.6	157.5
	9	0000	T.S.	980	23	18.0	156.5
		0600	S.T.S.	975	25	18.4	155.6
		1200	S.T.S.	965	31	18.7	154.7
		1800	T.	960	33	19.0	153.9
	10	0000	T.	950	39	19.3	153.0
		0600	T.	960	33	19.5	152.0
		1200	T.	960	33	19.8	151.1
		1800	T.	955	36	20.1	150.2
	11	0000	T.	950	39	20.5	149.3
		0600	T.	955	36	20.8	148.5
		1200	T.	950	39	21.2	147.8
		1800	T.	950	41	21.6	147.0
	12	0000	T.	950	41	22.0	146.4
		0600	T.	950	41	22.5	145.9
		1200	T.	945	43	22.8	145.5
		1800	T.	955	36	23.2	145.2
	13	0000	T.	955	36	23.6	144.9
		0600	T.	955	36	24.0	144.7
		1200	T.	955	36	24.5	144.4
		1800	T.	955	36	25.0	144.1
	14	0000	T.	955	36	25.5	143.9
		0600	T.	950	41	26.0	143.6
		1200	T.	950	41	26.4	143.2
		1800	T.	955	39	26.8	142.6
	15	0000	T.	955	39	27.0	142.0
		0600	T.	955	39	27.1	141.5
		1200	T.	960	33	27.3	140.9
		1800	S.T.S.	965	31	27.4	140.2
	16	0000	S.T.S.	970	28	27.7	139.4
		0600	S.T.S.	970	25	27.9	138.3
		1200	S.T.S.	970	25	28.2	137.2
		1800	S.T.S.	970	25	28.5	136.1
	17	0000	S.T.S.	965	28	28.9	135.0
		0600	S.T.S.	965	28	29.3	134.1
		1200	S.T.S.	970	25	29.8	133.4
		1800	S.T.S.	970	25	30.3	132.7
	18	0000	T.S.	975	21	30.9	132.2
		0600	T.D.	980	16	31.6	131.9

Dissipated

SIX-HOURLY POSITION AND INTENSITY DATA OF TROPICAL DEPRESSION LOIS (9214)

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °E	Long. °N
Aug	14	0600	T.D.	995	13	14.8	128.1
		1200	T.D.	990	16	14.9	128.8
		1800	T.D.	990	16	15.2	129.5
	15	0000	T.D.	990	16	15.5	130.1
		0600	T.D.	990	16	15.8	130.6
		1200	T.D.	990	16	16.2	131.0
		1800	T.D.	990	16	16.5	131.4
	16	0000	T.D.	990	16	16.5	131.4
		0600	T.D.	990	16	16.9	132.0
		1200	T.D.	990	16	17.8	133.5
		1800	T.D.	990	16	18.1	134.1
	17	0000	T.D.	990	16	18.4	134.5
		0600	T.D.	990	16	18.7	135.0
		1200	T.D.	990	16	19.0	135.6
		1800	T.D.	995	16	19.5	136.1
	18	0000	T.D.	995	13	20.1	136.6
		0600	T.D.	995	13	20.9	137.1
		1200	T.D.	995	13	21.8	137.6
		1800	T.D.	995	13	22.8	138.1
	19	0000	T.D.	995	13	24.0	138.5
		0600	T.D.	995	13	25.2	139.0
		1200	T.D.	990	16	26.2	139.7
		1800	T.D.	995	13	27.1	140.5

Dissipated

SIX-HOURLY POSITION AND INTENSITY DATA OF TROPICAL STORM MARK (9212)

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °E	Long. °N
Aug	16	0000	T.D.	990	13	21.1	117.1
		0600	T.D.	990	13	20.9	116.6
		1200	T.D.	990	13	20.5	116.9
		1800	T.D.	990	16	21.0	117.5
	17	0000	T.S.	985	18	21.5	117.9
		0600	T.S.	985	21	21.8	118.1
		1200	T.S.	980	23	22.2	118.2
		1800	T.S.	980	23	22.6	118.1
	18	0000	T.S.	980	23	22.9	117.9
		0600	T.S.	985	21	23.1	117.7
		1200	T.D.	995	16	23.3	117.5
		1800	T.S.	990	18	23.4	117.2
	19	0000	T.S.	990	21	23.5	116.8
		0600	T.D.	995	13	23.3	116.5

Dissipated

SIX-HOURLY POSITION AND INTENSITY DATA OF TROPICAL STORM NINA (9213)

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °E	Long. °N
Aug	17	1200	T.D.	1005	13	23.8	161.2
		1800	T.D.	1000	16	24.5	161.0
	18	0000	T.S.	995	18	25.2	160.6
		0600	T.S.	990	21	25.9	160.2
		1200	T.S.	995	18	26.5	159.7
		1800	T.S.	995	18	27.2	159.1
	19	0000	T.D.	1000	16	28.0	158.4
		0600	T.D.	1000	16	28.9	157.6
		1200	T.D.	1000	16	30.1	156.5
		1800	T.D.	1005	13	31.5	155.5
	20	0000	T.D.	1005	13	33.1	155.3
		0600	T.S.	995	18	35.0	155.6
		1200	T.D.	1000	16	37.0	156.9
		1800	T.D.	1000	16	38.7	159.0
	21	0000	T.D.	1000	16	39.5	161.8

Became Extratropical

SIX-HOURLY POSITION AND INTENSITY DATA OF TYPHOON OMAR (9215)

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °E	Long. °N
Aug	24	1200	T.D.	1000	13	8.9	154.7
		1800	T.D.	1000	13	9.3	153.8
	25	0000	T.D.	995	16	9.6	153.0
		0600	T.D.	995	16	9.9	152.2
		1200	T.D.	995	16	10.2	151.4
		1800	T.S.	990	18	10.5	150.5
	26	0000	T.S.	990	18	10.7	149.8
		0600	T.S.	985	21	11.1	149.2
		1200	T.S.	985	21	11.4	149.0
		1800	T.S.	980	23	11.6	148.8
	27	0000	S.T.S.	975	25	11.8	148.7
		0600	S.T.S.	970	28	12.3	148.3
		1200	S.T.S.	965	31	12.6	147.7
		1800	S.T.S.	965	31	12.9	146.9
	28	0000	S.T.S.	965	31	13.2	146.0
		0600	T.	960	33	13.5	145.0
		1200	T.	955	36	13.7	144.1
		1800	T.	945	43	13.9	143.3
	29	0000	T.	935	49	14.1	142.5
		0600	T.	935	49	14.3	141.7
		1200	T.	945	43	14.0	141.1
		1800	T.	945	43	14.5	140.6
	30	0000	T.	945	43	14.9	140.0
		0600	T.	955	39	15.3	139.6
		1200	T.	960	36	15.6	139.1
		1800	T.	960	36	16.0	138.4
	31	0000	T.	945	43	16.5	137.7
		0600	T.	945	43	16.9	136.9
		1200	T.	950	41	17.1	136.0
		1800	T.	955	39	17.7	135.1
Sep	1	0000	T.	955	39	18.5	134.2
		0600	T.	960	36	19.2	133.1
		1200	T.	960	36	20.0	132.0
		1800	T.	965	33	20.6	130.7
	2	0000	S.T.S.	970	31	21.1	129.5
		0600	S.T.S.	975	28	21.4	128.6
		1200	S.T.S.	975	28	21.7	127.8
		1800	S.T.S.	970	31	21.9	127.1
	3	0000	S.T.S.	970	31	22.1	126.3
		0600	S.T.S.	975	28	22.4	125.5
		1200	S.T.S.	975	28	22.6	124.8
		1800	S.T.S.	970	31	22.8	124.1
	4	0000	S.T.S.	970	31	23.1	123.3
		0600	S.T.S.	970	31	23.4	122.4
		1200	S.T.S.	975	28	23.8	121.2
		1800	S.T.S.	975	25	24.2	120.1
	5	0000	T.S.	980	23	24.5	119.0
		0600	T.S.	985	18	24.5	117.9
		1200	T.D.	990	13	24.2	116.8

Dissipated

SIX-HOURLY POSITION AND INTENSITY DATA OF TROPICAL DEPRESSION POLLY(I) (9216)

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °E	Long. °N
Aug	26	0600	T.D.	995	13	19.2	134.5
		1200	T.D.	995	13	19.8	134.1
		1800	T.D.	995	13	20.3	133.8
	27	0000	T.D.	990	16	20.8	133.5
		0600	T.D.	995	13	21.4	133.2
			Dissipated				

TROPICAL DEPRESSION POLLY(II) (9216)

Aug	27	0600	T.D.	985	13	23.2	125.8
		1200	T.D.	985	13	23.0	125.2
		1800	T.D.	985	13	22.7	124.8
	28	0000	T.D.	985	13	22.5	124.5
			Dissipated				

TROPICAL STORM POLLY (III) (9216)

Aug	29	0600	T.D.	970	13	22.8	123.4
		1200	T.D.	970	16	23.0	123.0
		1800	T.S.	970	21	23.3	122.5
	30	0000	T.S.	970	23	23.6	122.1
		0600	T.S.	970	21	24.0	121.8
		1200	T.S.	970	18	24.9	121.0
		1800	T.S.	975	18	25.3	120.1
	31	0000	T.S.	980	18	25.6	119.3
		0600	T.D.	980	13	25.8	118.8
			Dissipated				

SIX-HOURLY POSITION AND INTENSITY DATA OF TYPHOON RYAN (9217)

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °E	Long. °N
Aug	31	1800	T.D.	1000	13	16.1	149.2
Sep	1	0000	T.D.	1000	16	16.3	148.5
		0600	T.D.	1000	16	16.6	147.7
		1200	T.S.	995	18	17.0	147.6
		1800	T.S.	990	21	17.4	147.9
	2	0000	T.S.	985	23	17.8	148.0
		0600	S.T.S.	980	25	18.1	147.8
		1200	S.T.S.	975	28	18.3	147.6
		1800	S.T.S.	975	28	18.5	147.4
	3	0000	S.T.S.	975	28	18.7	147.2
		0600	S.T.S.	970	31	18.9	147.0
		1200	T.	960	36	19.2	146.8
		1800	T.	955	36	19.4	146.4
	4	0000	T.	955	36	19.2	146.2
		0600	T.	955	36	19.1	146.4
		1200	T.	950	39	19.1	146.6
		1800	T.	950	39	19.2	146.7
	5	0000	T.	950	39	19.4	146.8
		0600	T.	950	39	19.7	146.8
		1200	T.	950	39	20.1	146.9
		1800	T.	950	39	20.6	147.0
	6	0000	T.	945	41	21.4	147.2
		0600	T.	945	41	22.4	147.6
		1200	T.	940	43	23.3	148.0
		1800	T.	940	43	24.1	148.6
	7	0000	T.	945	41	24.8	149.4
		0600	T.	945	41	25.4	149.8
		1200	T.	945	41	25.9	150.0
		1800	T.	945	41	26.4	150.1
	8	0000	T.	945	41	26.9	150.0
		0600	T.	950	39	27.4	149.5
		1200	T.	955	36	27.7	148.8
		1800	T.	955	36	28.1	148.0
	9	0000	T.	950	39	28.5	147.2
		0600	T.	950	39	29.1	146.4
		1200	T.	950	39	29.8	145.6
		1800	T.	955	36	30.6	144.9
	10	0000	T.	955	33	31.5	144.2
		0600	S.T.S.	960	31	32.6	144.0
		1200	S.T.S.	965	28	33.8	144.1
		1800	S.T.S.	965	28	35.1	144.7
	11	0000	S.T.S.	965	28	37.1	145.6
		0600	S.T.S.	965	25	39.9	146.4

Became Extratropical

SIX-HOURLY POSITION AND INTENSITY DATA OF TYPHOON SIBYL (9218)

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °E	Long. °N
Sep	7	0600	T.D.	1000	13	20.6	166.4
		1200	T.D.	995	13	20.1	166.7
		1800	T.D.	990	16	19.6	167.0
	8	0000	T.S.	985	21	19.2	167.1
		0600	T.S.	985	23	18.9	167.3
		1200	S.T.S.	980	28	18.7	167.5
		1800	S.T.S.	975	31	18.8	167.7
	9	0000	T.	970	33	19.0	167.7
		0600	T.	970	33	19.2	167.7
		1200	T.	970	33	19.6	167.7
		1800	T.	970	33	20.3	167.6
	10	0000	T.	970	33	21.4	167.3
		0600	T.	975	33	22.5	166.3
		1200	T.	960	36	23.2	164.9
		1800	T.	960	36	23.8	163.4
	11	0000	T.	955	39	24.4	162.0
		0600	T.	950	41	24.9	160.7
		1200	T.	945	43	25.5	159.4
		1800	T.	945	43	26.2	158.2
	12	0000	T.	950	41	27.2	157.1
		0600	T.	960	36	28.3	156.1
		1200	T.	970	33	29.2	155.3
		1800	S.T.S.	975	31	29.9	154.7
	13	0000	S.T.S.	980	28	30.6	154.3
		0600	S.T.S.	980	28	31.3	154.0
		1200	S.T.S.	980	28	32.1	154.0
		1800	S.T.S.	980	28	32.9	154.2
	14	0000	S.T.S.	980	28	33.7	154.7
		0600	S.T.S.	980	28	34.7	155.8
		1200	S.T.S.	980	28	35.6	157.0
		1800	S.T.S.	980	28	36.6	158.1

Became Extratropical

SIX-HOURLY POSITION AND INTENSITY DATA OF SEVERE TROPICAL STORM TED (9219)

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °E	Long. °N
Sep	18	0000	T.D.	1000	13	15.1	137.0
		0600	T.D.	1000	16	15.2	136.1
		1200	T.D.	1000	16	15.3	134.5
		1800	T.S.	995	18	15.4	132.8
	19	0000	T.S.	990	21	15.4	131.2
		0600	T.S.	990	21	15.7	129.6
		1200	T.S.	990	21	16.1	128.7
		1800	T.S.	990	21	16.7	127.8
	20	0000	T.S.	990	21	17.6	126.6
		0600	T.S.	990	21	18.6	124.6
		1200	T.S.	985	23	19.1	122.6
		1800	S.T.S.	980	25	19.1	121.7
	21	0000	S.T.S.	980	25	18.9	122.1
		0600	S.T.S.	980	25	19.5	122.0
		1200	T.S.	985	23	20.2	121.6
		1800	S.T.S.	980	25	21.1	121.6
	22	0000	S.T.S.	980	25	22.0	121.7
		0600	S.T.S.	980	25	23.4	121.6
		1200	S.T.S.	980	25	24.9	120.7
		1800	S.T.S.	980	25	26.4	120.6
	23	0000	T.S.	985	23	28.0	120.6
		0600	T.S.	990	21	29.5	120.6
		1200	T.S.	995	18	30.8	120.6

Became Extratropical

SIX-HOURLY POSITION AND INTENSITY DATA OF TROPICAL STORM VAL (9220)

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °E	Long. °N
Sep	24	0600	T.D.	995	13	18.1	156.4
		1200	T.D.	995	13	19.0	156.2
		1800	T.D.	995	16	20.0	156.0
	25	0000	T.D.	995	16	21.0	155.6
		0600	T.D.	995	16	22.0	155.0
		1200	T.S.	990	18	23.1	154.1
		1800	T.S.	990	21	24.5	153.5
	26	0000	T.S.	985	23	26.1	153.2
		0600	T.S.	990	21	27.9	152.7
		1200	T.S.	990	21	29.9	151.6
		1800	T.S.	990	18	31.8	150.4
	27	0000	T.S.	990	18	33.9	149.6

Became Extratropical

SIX-HOURLY POSITION AND INTENSITY DATA OF TYPHOON WARD (9221)

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °E	Long. °N
Sep	27	0000	T.S.	990	18	15.3	180.0
		0600	T.S.	990	18	15.8	179.1
		1200	T.S.	985	21	16.2	178.4
		1800	T.S.	980	23	16.6	177.7
	28	0000	S.T.S.	975	25	16.9	177.0
		0600	S.T.S.	975	25	16.9	176.5
		1200	S.T.S.	970	28	16.7	176.9
		1800	T.	960	33	17.0	177.3
	29	0000	T.	955	39	17.5	177.5
		0600	T.	960	36	18.3	177.6
		1200	T.	960	36	19.5	177.5
		1800	T.	960	36	20.9	177.1
	30	0000	T.	970	33	22.2	176.5
		0600	S.T.S.	975	31	23.5	175.9
		1200	S.T.S.	975	31	24.7	174.9
		1800	S.T.S.	970	31	25.5	173.5
Oct	1	0000	T.	965	33	25.9	171.9
		0600	T.	955	39	25.8	170.3
		1200	T.	955	39	25.5	168.6
		1800	T.	950	41	25.1	167.0
	2	0000	T.	950	41	24.7	165.5
		0600	T.	950	41	24.3	164.2
		1200	T.	950	41	23.9	163.0
		1800	T.	950	41	23.7	161.8
	3	0000	T.	955	39	23.6	160.9
		0600	T.	955	39	23.8	160.1
		1200	T.	955	39	24.2	159.6
		1800	T.	955	39	24.8	159.2
	4	0000	T.	955	39	25.5	159.0
		0600	T.	955	39	26.2	159.0
		1200	T.	960	36	27.1	159.2
		1800	T.	960	36	28.2	159.2
	5	0000	T.	960	36	29.3	158.7
		0600	T.	960	36	30.4	158.8
		1200	T.	965	33	31.8	159.0
		1800	S.T.S.	975	28	33.2	158.9
	6	0000	S.T.S.	980	25	34.6	159.1
		0600	T.S.	985	23	36.6	160.3
		1200	T.S.	985	23	38.5	161.6

Became Extratropical

SIX-HOURLY POSITION AND INTENSITY DATA OF TYPHOON YVETTE (9222)

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °E	Long. °N
Oct	8	0000	T.D.	1000	13	15.5	130.5
		0600	T.S.	990	18	15.5	129.8
		1200	T.S.	985	21	15.4	129.0
		1800	T.S.	980	23	15.2	128.2
	9	0000	S.T.S.	975	25	15.1	127.4
		0600	S.T.S.	970	28	15.1	126.7
		1200	S.T.S.	970	28	15.1	126.2
		1800	S.T.S.	965	31	15.1	125.9
	10	0000	S.T.S.	965	31	15.1	125.7
		0600	T.	960	33	15.3	125.8
		1200	T.	950	39	15.6	125.9
		1800	T.	940	43	15.9	125.7
	11	0000	T.	935	49	15.6	125.8
		0600	T.	945	41	15.7	126.1
		1200	T.	955	36	15.8	126.4
		1800	T.	955	36	16.0	126.8
	12	0000	T.	955	36	16.3	127.1
		0600	T.	955	36	16.7	127.3
		1200	T.	955	36	17.1	127.7
		1800	T.	950	39	17.4	128.1
	13	0000	T.	945	41	17.7	128.5
		0600	T.	940	46	18.1	129.0
		1200	T.	940	46	18.6	129.2
		1800	T.	940	46	19.1	129.3
	14	0000	T.	940	46	19.6	129.4
		0600	T.	940	46	20.2	129.5
		1200	T.	940	46	20.8	129.9
		1800	T.	940	46	21.4	130.6
	15	0000	T.	940	46	21.9	131.3
		0600	T.	940	46	22.4	132.0
		1200	T.	945	41	23.2	133.0
		1800	T.	950	39	24.1	134.0
	16	0000	T.	955	36	25.0	135.0
		0600	T.	960	33	26.0	136.3
		1200	S.T.S.	970	28	27.1	137.9
		1800	T.S.	980	23	27.9	139.4
	17	0000	T.S.	985	18	28.6	140.4
		0600	T.D.	990	16	29.4	141.3

Became Extratropical

SIX-HOURLY POSITION AND INTENSITY DATA OF TROPICAL DEPRESSION ZACK (9223)

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °E	Long. °N
Oct	10	1200	T.D.	1000	13	13.7	163.7
		1800	T.D.	1000	13	15.2	163.8
	11	0000	T.D.	1000	13	16.6	163.1
		0600	T.D.	998	16	17.7	162.0
		1200	T.D.	1000	13	18.6	160.8

Dissipated

SIX-HOURLY POSITION AND INTENSITY DATA OF TYPHOON ANGELA (9224)

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °E	Long. °N
Oct	16	1800	T.D.	995	13	13.3	118.7
	17	0000	T.D.	990	16	13.6	118.4
		0600	T.S.	985	18	13.6	117.9
		1200	T.S.	980	21	13.6	117.4
		1800	S.T.S.	975	25	13.3	116.8
	18	0000	S.T.S.	970	31	13.0	116.3
		0600	T.	965	33	12.7	115.8
		1200	T.	965	33	12.3	115.3
		1800	S.T.S.	970	31	12.0	114.8
	19	0000	S.T.S.	970	31	11.9	114.3
		0600	S.T.S.	970	31	11.8	113.9
		1200	S.T.S.	980	25	12.1	113.5
		1800	T.S.	985	23	12.5	113.2
	20	0000	S.T.S.	980	25	12.7	112.7
		0600	S.T.S.	975	28	12.2	112.6
		1200	S.T.S.	975	28	12.5	112.8
		1800	S.T.S.	975	28	12.8	112.8
	21	0000	S.T.S.	975	28	13.0	112.7
		0600	S.T.S.	980	28	13.2	112.6
		1200	T.S.	985	23	13.3	112.5
		1800	T.S.	985	23	13.4	112.4
	22	0000	S.T.S.	980	25	13.5	112.2
		0600	S.T.S.	980	25	13.4	111.8
		1200	S.T.S.	980	25	13.3	111.4
		1800	S.T.S.	975	28	13.3	111.0
	23	0000	S.T.S.	970	31	13.2	110.5
		0600	S.T.S.	975	28	13.1	109.9
		1200	T.S.	985	21	12.9	108.9
		1800	T.D.	995	13	12.5	107.5

Dissipated

SIX-HOURLY POSITION AND INTENSITY DATA OF TYPHOON BRIAN (9225)

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °E	Long. °N
Oct	17	1200	T.D.	1000	13	10.9	157.2
		1800	T.D.	995	16	10.9	156.0
	18	0000	T.D.	995	16	11.0	154.8
		0600	T.D.	995	16	11.1	153.6
		1200	T.S.	990	18	11.3	152.4
		1800	T.S.	985	21	11.4	151.3
	19	0000	T.S.	985	23	11.6	150.2
		0600	T.S.	985	23	11.7	149.1
		1200	T.S.	985	23	11.9	148.3
		1800	T.S.	985	23	12.0	147.6
	20	0000	T.S.	990	21	12.1	147.0
		0600	T.S.	995	18	12.3	146.5
		1200	T.S.	990	23	12.5	146.0
		1800	S.T.S.	985	25	12.8	145.5
	21	0000	S.T.S.	980	28	13.3	144.9
		0600	S.T.S.	975	31	13.8	144.3
		1200	S.T.S.	975	31	14.5	143.5
		1800	T.	970	33	15.3	142.8
	22	0000	T.	960	39	16.1	142.1
		0600	T.	970	33	17.6	141.0
		1200	T.	970	33	17.9	141.0
		1800	S.T.S.	975	31	18.8	140.4
	23	0000	S.T.S.	975	28	19.7	139.8
		0600	S.T.S.	980	25	20.6	139.2
		1200	S.T.S.	980	25	21.6	138.6
		1800	T.S.	985	23	22.8	138.0
	24	0000	T.S.	985	21	24.4	137.6
		0600	T.S.	990	18	26.2	137.9
		1200	T.D.	995	16	27.9	139.0

Dissipated

SIX-HOURLY POSITION AND INTENSITY DATA OF TYPHOON COLLEEN (9226)

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °E	Long. °N
Oct	18	1200	T.D.	1000	13	11.7	130.9
		1800	T.D.	1000	16	12.3	130.3
	19	0000	T.S.	995	18	12.9	129.9
		0600	T.S.	990	21	13.5	129.7
		1200	T.S.	990	21	14.0	129.9
		1800	T.S.	990	21	14.3	130.2
	20	0000	T.S.	990	21	14.5	130.5
		0600	T.S.	990	21	14.7	130.7
		1200	T.S.	985	23	14.9	130.4
		1800	T.S.	985	23	14.6	130.2
	21	0000	S.T.S.	980	25	14.4	130.4
		0600	S.T.S.	980	25	14.1	130.6
		1200	S.T.S.	980	25	13.8	130.8
		1800	S.T.S.	975	28	13.5	130.9
	22	0000	S.T.S.	970	31	13.1	130.9
		0600	S.T.S.	975	28	12.8	130.7
		1200	S.T.S.	980	25	12.8	130.3
		1800	S.T.S.	980	25	13.0	130.0
	23	0000	S.T.S.	980	25	13.3	129.8
		0600	T.S.	985	23	13.7	129.8
		1200	T.S.	990	21	14.1	129.8
		1800	T.D.	995	16	14.6	129.9
	24	0000	T.D.	995	13	15.1	129.9
		0600	T.D.	995	13	15.5	129.3
		1200	T.D.	995	13	15.5	128.4
		1800	T.D.	995	16	15.4	127.8
	25	0000	T.S.	985	21	15.3	126.5
		0600	T.S.	980	23	15.1	125.2
		1200	T.S.	980	23	15.0	123.9
		1800	T.S.	985	21	14.9	122.6
	26	0000	T.S.	985	21	14.5	121.1
		0600	T.S.	990	18	14.1	119.6
		1200	T.S.	980	23	14.0	118.0
		1800	S.T.S.	975	28	13.7	116.4
	27	0000	T.	965	33	13.4	114.8
		0600	S.T.S.	970	31	13.3	113.1
		1200	S.T.S.	980	25	13.6	111.7
		1800	T.S.	985	23	14.0	110.7
	28	0000	T.S.	990	21	14.3	109.7
		0600	T.S.	990	18	14.5	108.7
		1200	T.D.	995	16	14.8	107.1
		1800	T.D.	995	13	15.0	105.4

Dissipated

SIX-HOURLY POSITION AND INTENSITY DATA OF TYPHOON DAN (9227)

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °E	Long. °N
Oct	23	1200	T.D.	1000	13	10.9	188.5
		1800	T.D.	1000	13	10.9	187.3
	24	0000	T.D.	1000	13	11.0	186.1
		0600	T.D.	995	16	11.1	184.9
		1200	T.D.	995	16	11.3	183.7
		1800	T.D.	995	16	11.6	182.6
	25	0000	T.D.	995	16	11.9	181.6
		0600	T.S.	990	18	12.2	180.6
		1200	T.S.	990	18	12.6	179.7
		1800	T.S.	990	18	13.0	178.8
	26	0000	T.S.	990	18	13.4	177.8
		0600	T.S.	990	21	14.0	176.2
		1200	T.S.	985	23	14.4	174.6
		1800	S.T.S.	980	25	15.0	172.9
	27	0000	S.T.S.	980	25	15.8	171.2
		0600	S.T.S.	975	28	16.5	170.0
		1200	S.T.S.	975	28	17.2	169.0
		1800	S.T.S.	970	31	17.9	168.0
	28	0000	S.T.S.	970	31	18.7	167.1
		0600	S.T.S.	970	31	19.5	166.3
		1200	T.	965	33	20.3	165.6
		1800	T.	960	36	21.2	164.9
	29	0000	T.	965	33	21.8	164.7
		0600	T.	965	33	22.2	164.6
		1200	T.	965	33	22.5	164.5
		1800	T.	965	33	22.3	164.3
	30	0000	T.	965	33	22.0	164.0
		0600	T.	965	33	21.5	163.3
		1200	T.	965	33	20.8	162.0
		1800	T.	965	33	20.1	160.6
	31	0000	T.	965	33	19.6	159.2
		0600	T.	965	33	19.2	157.7
		1200	T.	965	33	19.1	156.2
		1800	T.	955	39	19.3	154.5
Nov	1	0000	T.	945	43	19.6	153.0
		0600	T.	940	46	20.0	151.5
		1200	T.	950	41	20.7	150.1
		1800	T.	950	41	21.5	149.1
	2	0000	T.	955	39	22.3	148.5
		0600	T.	955	39	23.1	148.8
		1200	T.	960	36	24.0	149.5
		1800	S.T.S.	970	31	25.0	150.7
	3	0000	S.T.S.	975	25	26.3	152.6
		0600	T.S.	985	21	27.7	155.0
		1200	T.D.	980	16	29.2	157.2
		1800	T.D.	990	13	30.9	159.1

Dissipated

SIX-HOURLY POSITION AND INTENSITY DATA OF TYPHOON ELSIE (9228)

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °E	Long. °N
Oct	29	0600	T.D.	995	13	7.8	151.0
		1200	T.D.	995	13	8.0	150.9
		1800	T.D.	995	13	8.3	150.7
	30	0000	T.D.	995	16	8.6	150.4
		0600	T.S.	990	18	8.9	150.1
		1200	T.S.	990	18	9.1	149.7
		1800	T.S.	985	21	9.3	149.2
	31	0000	T.S.	985	21	9.5	148.7
		0600	T.S.	985	23	9.6	148.1
		1200	S.T.S.	980	25	9.7	147.6
		1800	S.T.S.	975	28	9.8	147.3
Nov	1	0000	S.T.S.	975	28	9.9	147.0
		0600	S.T.S.	980	25	10.1	146.7
		1200	S.T.S.	980	25	10.4	146.3
		1800	T.S.	985	23	10.8	146.0
	2	0000	T.S.	985	23	11.1	145.7
		0600	T.S.	985	23	11.5	145.4
		1200	S.T.S.	980	25	11.8	145.1
		1800	S.T.S.	975	28	12.2	144.5
	3	0000	S.T.S.	970	31	12.6	143.9
		0600	T.	965	33	13.0	143.1
		1200	T.	955	39	13.4	142.3
		1800	T.	950	41	13.8	141.4
	4	0000	T.	950	41	14.3	140.3
		0600	T.	950	41	14.8	139.2
		1200	T.	950	41	15.4	138.2
		1800	T.	950	41	16.0	137.1
	5	0000	T.	940	46	16.8	136.0
		0600	T.	940	46	17.8	135.0
		1200	T.	940	46	19.0	134.2
		1800	T.	945	43	20.3	133.8
	6	0000	T.	950	41	21.7	133.8
		0600	T.	955	39	23.2	134.4
		1200	T.	960	36	25.3	135.7
		1800	S.T.S.	970	31	27.9	137.1

Became Extratropical

SIX-HOURLY POSITION AND INTENSITY DATA OF TYPHOON FORREST (9229)

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °E	Long. °N
Nov	13	0000	T.D.	1000	13	8.4	112.1
		0600	T.D.	1000	13	8.6	110.5
		1200	T.D.	1000	13	8.4	109.0
		1800	T.D.	995	16	7.8	107.8
	14	0000	T.D.	995	16	7.6	106.7
		0600	T.D.	995	16	7.6	105.6
		1200	T.D.	1000	13	7.7	104.5
		1800	T.D.	995	16	7.8	103.3
	15	0000	T.S.	990	21	8.0	102.0
		0600	T.S.	990	23	8.3	100.6
		1200	T.S.	990	23	8.6	99.0
		1800	T.D.	1000	16	8.8	97.4
	16	0000	T.D.	1000	13	9.0	96.1
		0600	T.D.	1000	16	9.2	94.9
		1200	T.S.	995	18	9.4	93.7
		1800	T.S.	990	21	9.5	92.5
	17	0000	T.S.	990	21	9.6	91.4
		0600	T.S.	985	23	9.8	90.3
		1200	S.T.S.	980	25	10.2	89.3
		1800	S.T.S.	975	28	10.9	88.6
	18	0000	S.T.S.	970	31	11.8	88.1
		0600	T.	965	33	12.8	87.8
		1200	T.	960	36	13.9	87.6
		1800	T.	955	39	15.0	87.5
	19	0000	T.	950	41	15.9	87.5
		0600	T.	950	41	16.6	87.7
		1200	T.	950	41	17.3	88.0
		1800	T.	950	41	17.9	88.4
	20	0000	T.	950	41	18.5	88.9
		0600	T.	955	39	19.0	89.4
		1200	T.	960	36	19.3	90.0
		1800	T.	965	33	19.6	90.6
	21	0000	S.T.S.	975	28	19.8	91.2
		0600	T.S.	985	23	19.9	91.8
		1200	T.S.	995	18	20.0	92.5

Dissipated

SIX-HOURLY POSITION AND INTENSITY DATA OF TYPHOON GAY (9230)

Month	Day	Time UTC	Intensity	Estimated minimum central pressure (hPa)	Estimated maximum surface winds (m/s)	Lat. °E	Long. °N
Nov	15	0000	T.D.	1000	13	7.0	174.8
		0600	T.D.	995	16	7.6	174.2
		1200	T.S.	990	18	8.4	173.8
		1800	T.S.	990	18	9.2	173.5
	16	0000	T.S.	990	18	9.9	173.1
		0600	T.S.	985	21	10.2	172.5
		1200	T.S.	985	21	10.2	171.8
		1800	T.S.	980	23	10.1	171.1
	17	0000	S.T.S.	975	25	10.1	170.5
		0600	S.T.S.	970	28	10.2	170.0
		1200	S.T.S.	970	28	10.4	169.6
		1800	S.T.S.	965	31	10.6	169.0
	18	0000	T.	960	33	10.7	168.2
		0600	T.	955	36	10.5	167.4
		1200	T.	950	39	10.3	166.6
		1800	T.	945	41	10.1	165.8
	19	0000	T.	940	43	10.0	164.9
		0600	T.	935	46	9.9	164.0
		1200	T.	930	49	9.9	163.1
		1800	T.	930	49	9.9	162.1
	20	0000	T.	930	49	10.1	161.1
		0600	T.	925	51	10.2	160.0
		1200	T.	930	49	10.5	158.7
		1800	T.	935	46	10.9	157.4
	21	0000	T.	945	43	11.3	156.0
		0600	T.	955	39	11.8	154.6
		1200	T.	965	33	12.1	153.1
		1800	T.	965	33	12.2	151.6
	22	0000	T.	965	33	12.4	150.2
		0600	T.	965	33	12.7	149.0
		1200	T.	965	33	12.9	147.9
		1800	T.	965	33	13.1	146.6
	23	0000	T.	965	33	13.4	145.2
		0600	T.	965	33	13.5	143.6
		1200	T.	965	33	13.7	142.2
		1800	T.	965	33	13.9	140.8
	24	0000	T.	965	33	14.3	139.4
		0600	T.	965	33	14.8	138.2
		1200	T.	965	33	15.3	137.0
		1800	T.	960	36	15.9	135.8
	25	0000	T.	955	39	16.4	134.6
		0600	T.	950	41	16.9	133.8
		1200	T.	945	43	17.4	133.1
		1800	T.	945	43	17.8	132.5
	26	0000	T.	945	43	18.1	132.0
		0600	T.	945	43	18.3	131.8
		1200	T.	945	43	18.3	131.7
		1800	T.	950	41	18.2	131.6
	27	0000	T.	955	39	18.1	131.3
		0600	T.	960	36	18.2	131.0
		1200	T.	965	33	18.3	130.7
		1800	S.T.S.	970	31	18.7	130.3
	28	0000	S.T.S.	970	31	19.3	130.0
		0600	S.T.S.	970	31	19.9	129.7
		1200	S.T.S.	975	28	20.6	129.6
		1800	T.S.	980	23	21.3	129.5
	29	0000	T.S.	980	23	22.2	129.6
		0600	T.S.	990	18	23.2	129.7

Dissipated

SIX-HOURLY POSITION AND INTENSITY DATA OF TYPHOON HUNT (9231)

Month	Day	Time UTC	Intensity	minimum central pressure (hPa)	maximum surface winds (m/s)	Lat. °E	Long. °N
Nov	16	0600	T.D.	1000	13	12.7	155.7
		1200	T.D.	1000	16	12.7	154.5
		1800	T.S.	995	18	12.7	153.1
	17	0000	T.S.	990	21	12.6	151.4
		0600	T.S.	985	23	12.6	149.6
		1200	S.T.S.	980	25	12.6	148.2
		1800	S.T.S.	970	31	12.7	146.8
	18	0000	S.T.S.	970	31	13.1	145.6
		0600	S.T.S.	970	31	13.9	144.5
		1200	T.	965	33	14.4	143.7
		1800	T.	960	36	14.9	142.9
	19	0000	T.	955	39	15.4	142.0
		0600	T.	955	39	16.1	141.1
		1200	T.	955	39	17.0	140.3
		1800	T.	950	41	17.9	139.7
	20	0000	T.	945	43	18.8	139.4
		0600	T.	940	46	20.0	139.5
		1200	T.	950	41	21.5	140.1
		1800	T.	960	36	23.5	141.5
	21	0000	S.T.S.	970	31	25.5	143.4
		0600	S.T.S.	980	25	27.9	146.3
		1200	T.S.	985	21	30.7	151.7

Became Extratropical