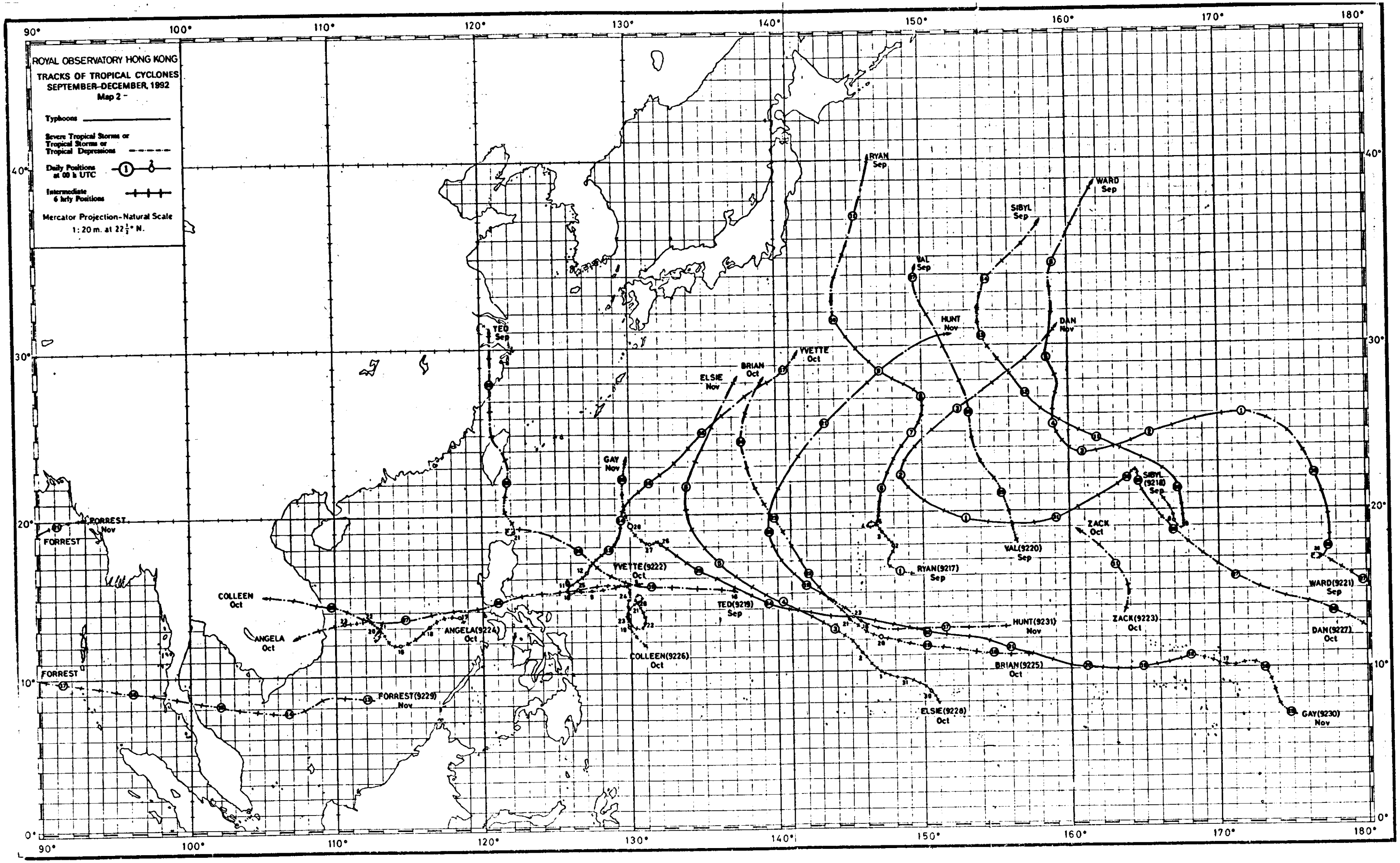
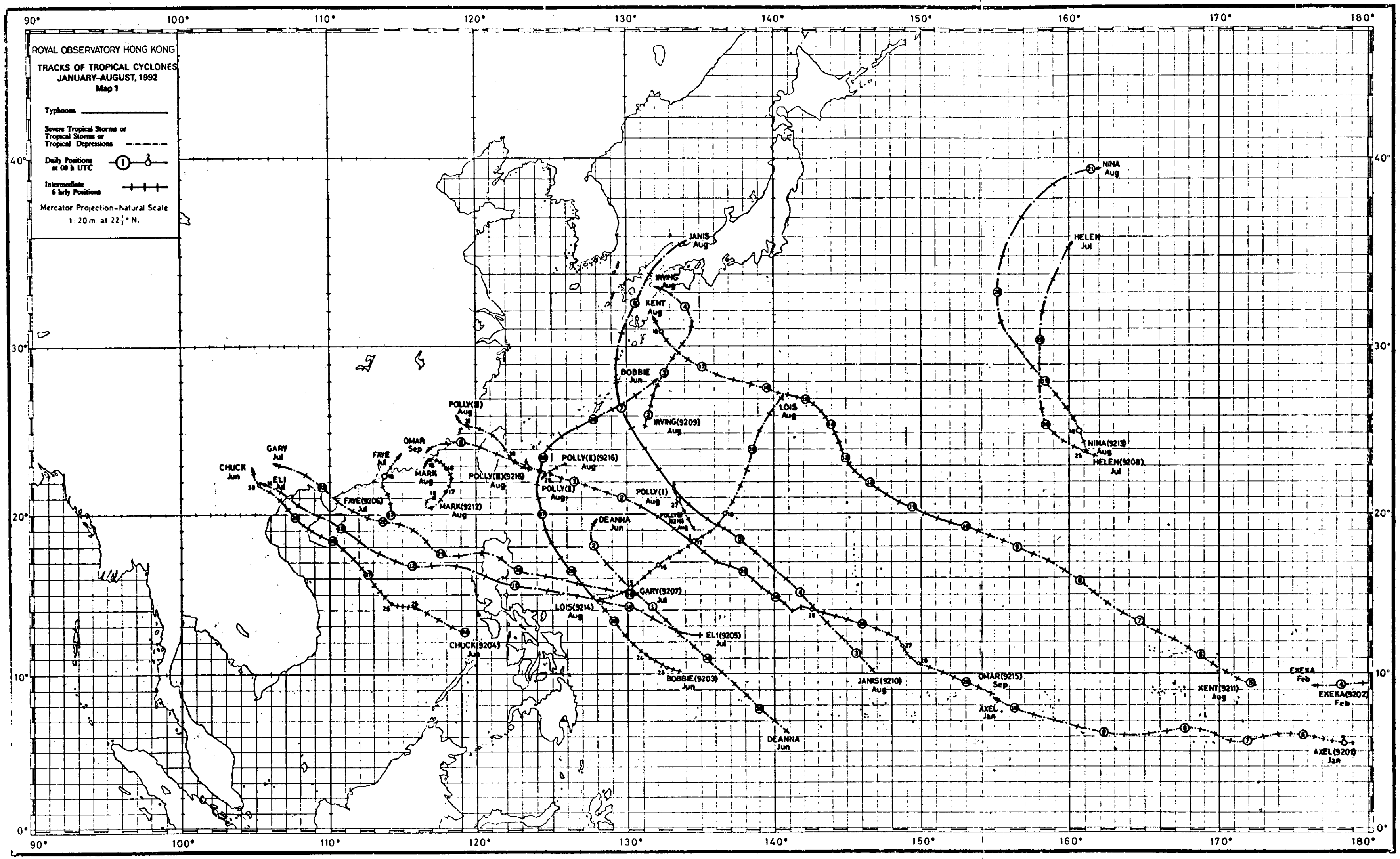

ROYAL OBSERVATORY HONG KONG
TRACKS OF TROPICAL CYCLONES
SEPTEMBER–DECEMBER, 1992
Map 2
Typhoons
Severe Tropical Storms or Tropical Storms or Tropical Depressions
Daily Positions at 00 h UTC
Intermediate 6 hrly Positions
Mercator Projection - Natural Scale
1: 20 m. at 22½° N.
90° 100° 110° 120° 130° 140° 150° 160° 170° 180°
0° 10° 20° 30° 40°
RYAN Sep
WARD Sep
SIBYL Sep
VAL Sep
HUNT Nov
DAN Nov
TED Sep
YVETTE Oct
BRIAN Oct
ELSIE Nov
GAY Nov
FORREST Nov
FORREST
COLLEEN Oct
ANGELA Oct
ZACK Oct
RYAN(9217) Sep
VAL(9220) Sep
SIBYL (9218) Sep
WARD(9221) Sep
DAN(9227) Oct
ZACK(9223) Oct
HUNT(9231) Nov
BRIAN(9225) Oct
GAY(9230) Nov
ELSIE(9228) Oct
TED(9219) Sep
YVETTE(9222) Oct
COLLEEN(9226) Oct
ANGELA(9224) Oct
FORREST(9229) 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 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°
0° 10° 20° 30° 40°
NINA Aug
HELEN Jul
JANIS Aug
IRVING Aug
KENT Aug
BOBBIE Jun
IRVING(9209) Aug
LOIS Aug
NINA(9213) Aug
HELEN(9208) Jul
POLLY(II) Aug
OMAR Sep
FAYE Jul
GARY Jul
CHUCK Jun
ELI Jul
MARK Aug
POLLY(II)(9216) Aug
POLLY(II)(9216)
POLLY(I) Aug
POLLY(I) Aug
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

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Prepared by
Royal Observatory
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Kowloon
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## FIGURES

# TABLES

## HONG KONG'S TROPICAL CYCLONE WARNING SIGNALS

| Signal | | Display: Symbol | Display: Lights | Meaning of the Signal |
|---|---|---|---|---|
| Stand By | 1 |  | White<br>White<br>White | A tropical cyclone is centred within about 800 kilometres of Hong Kong and may later affect Hong Kong. |
| Strong Wind | 3 |  | Green<br>White<br>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<br>Gale or Storm | 8NW |  | White<br>Green<br>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<br>Gale or Storm | 8SW |  | Green<br>White<br>White | |
| NE'ly<br>Gale or Storm | 8NE |  | Green<br>Green<br>White | |
| SE'ly<br>Gale or Storm | 8SE |  | White<br>White<br>Green | |
| Increasing<br>Gale or Storm | 9 |  | Green<br>Green<br>Green | Gale or storm force wind is increasing or expected to increase significantly in strength. |
| Hurricane | 10 |  | Red<br>Green<br>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.

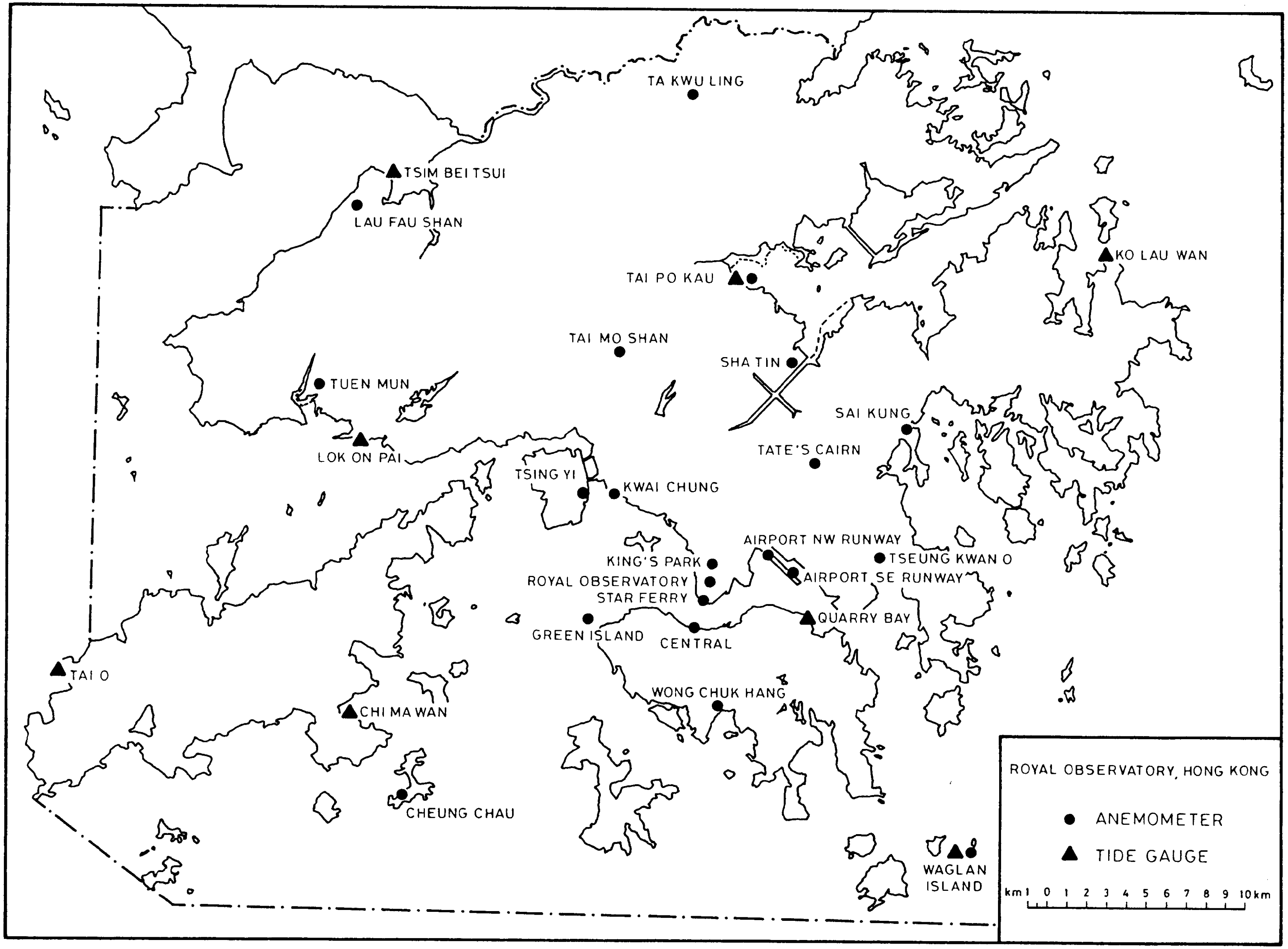


Figure 1. Locations of anemometers and tide gauge stations in Hong Kong.

# 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.

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

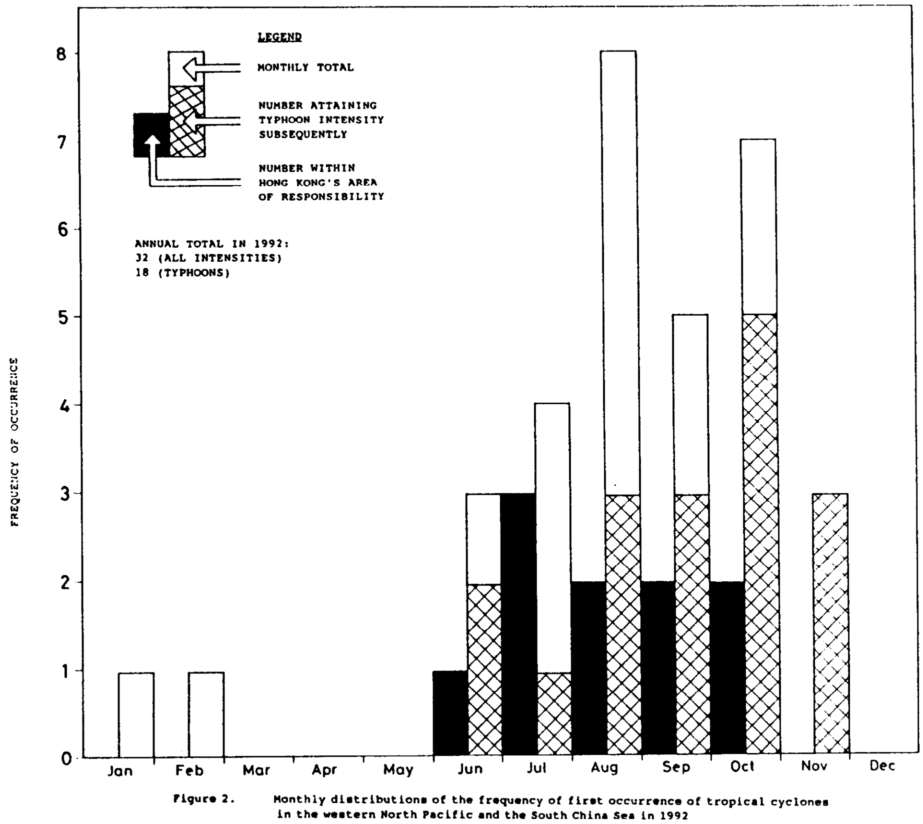


Figure 2. Monthly distribution of the frequency of first occurrence of tropical cyclones in the western North Pacific and the South China Sea in 1992

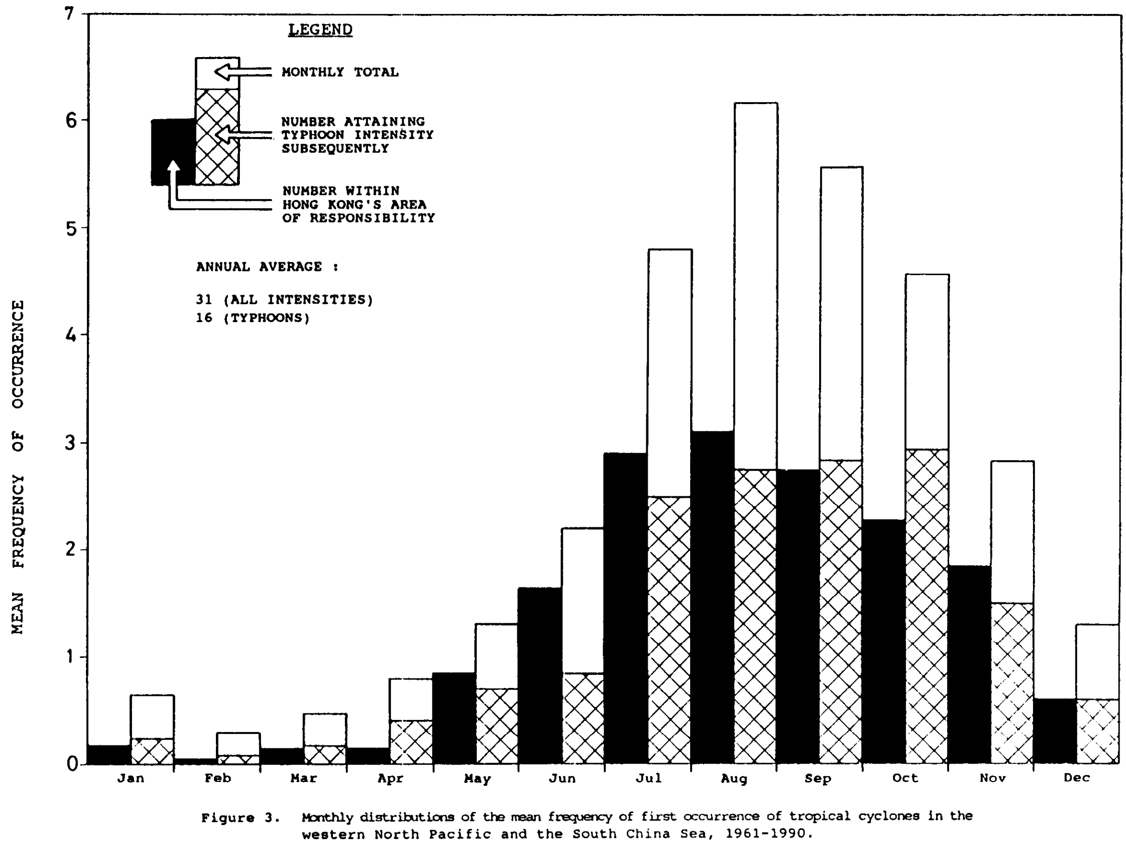


**Figure 3. Monthly distribution of the mean frequency of first occurrence of tropical cyclones in the western North Pacific and the South China Sea, 1961–1990.**

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.

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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 Direction | Maximum Gust Speed(km/h) | Maximum Gust Date | Maximum Gust Time | Maximum Hourly Wind Direction | Maximum Hourly Wind Speed(km/h) | Maximum Hourly Wind Date | Maximum Hourly Wind 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. |

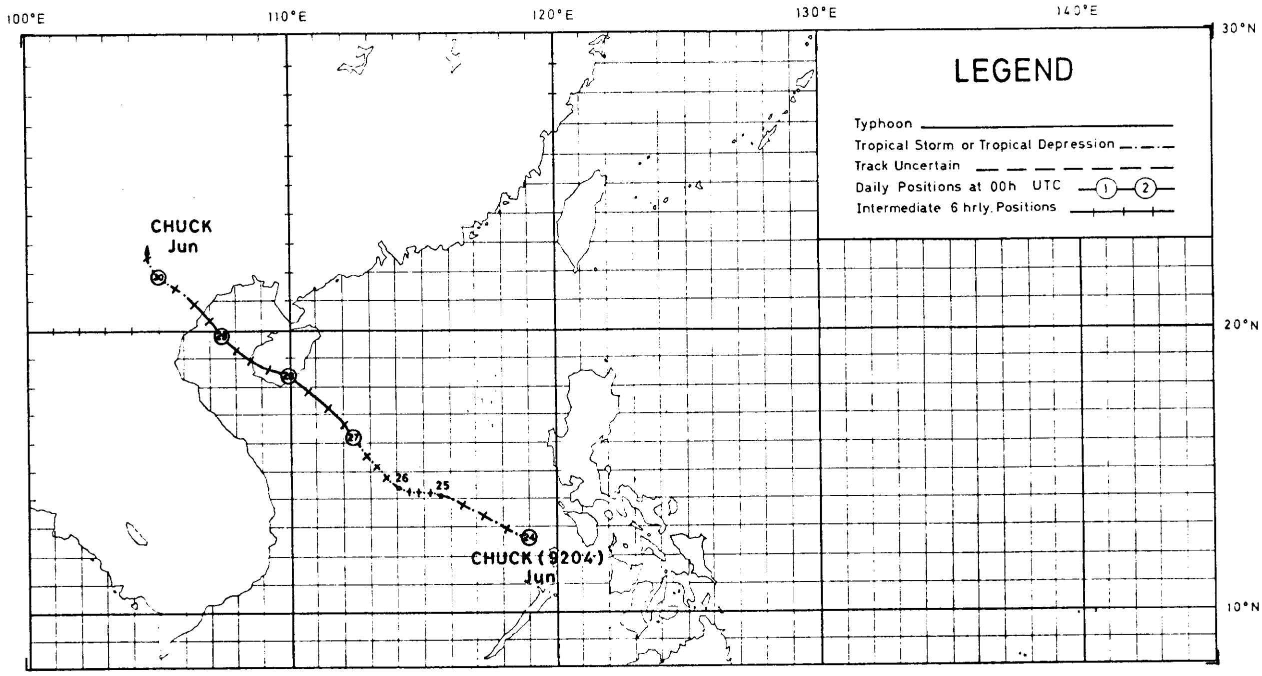


**Figure 4. Track of Typhoon Chuck (9204): 24–30 June 1992**

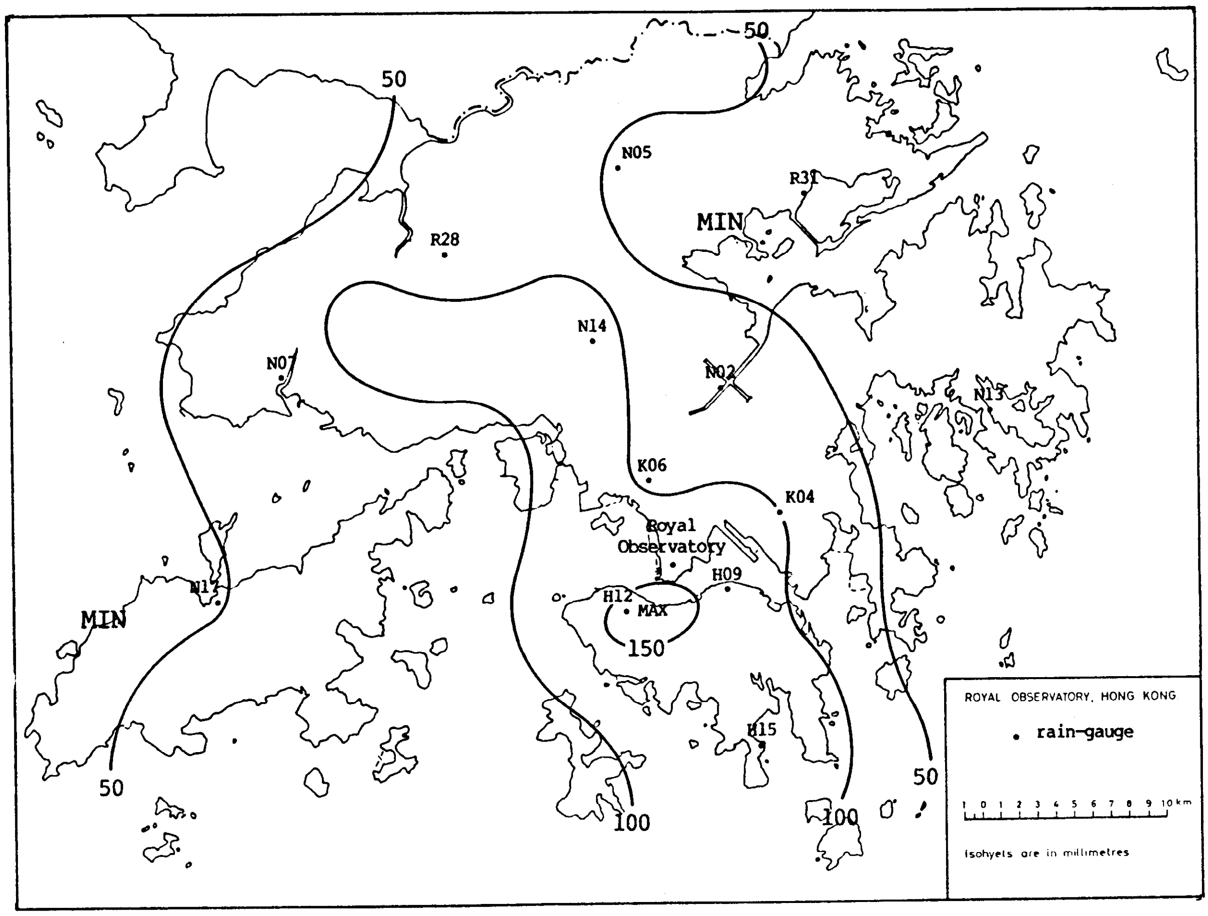


**Figure 5. Rainfall (mm) distribution on 27–30 June 1992**

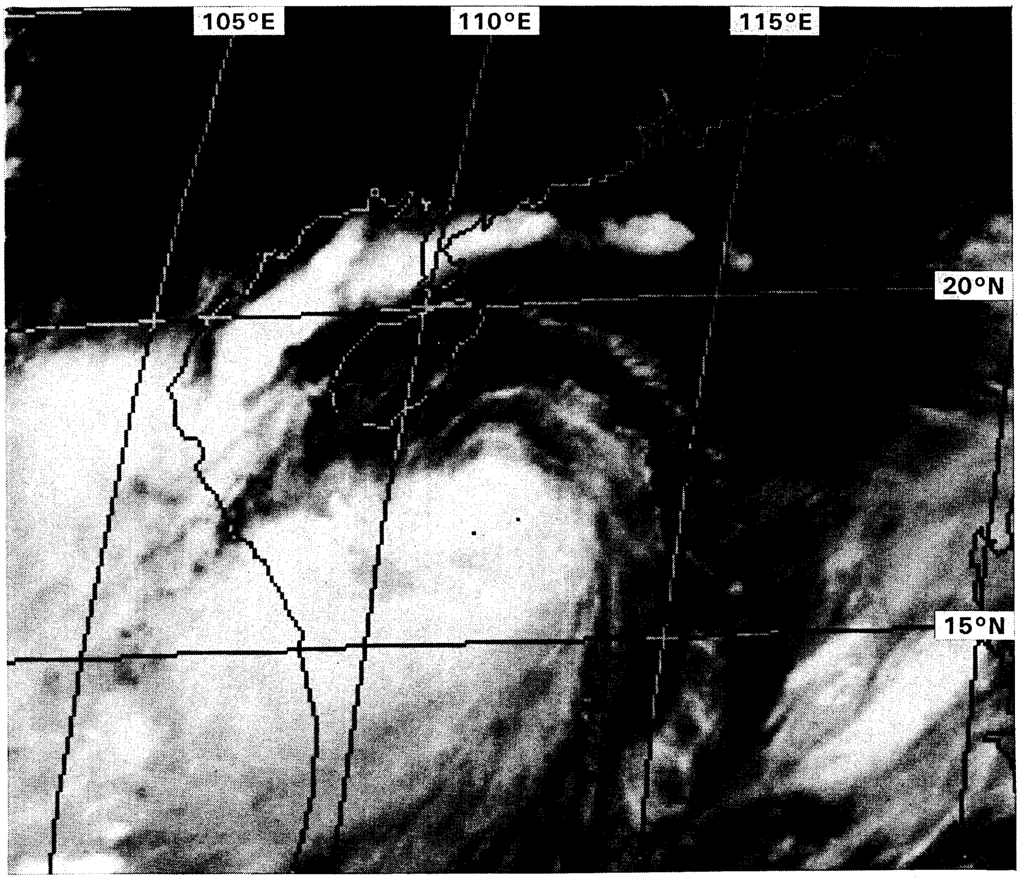


**Figure 6. GMS-4 infra-red imagery of Chuck at around 5 p.m. on 27 June 1992.**

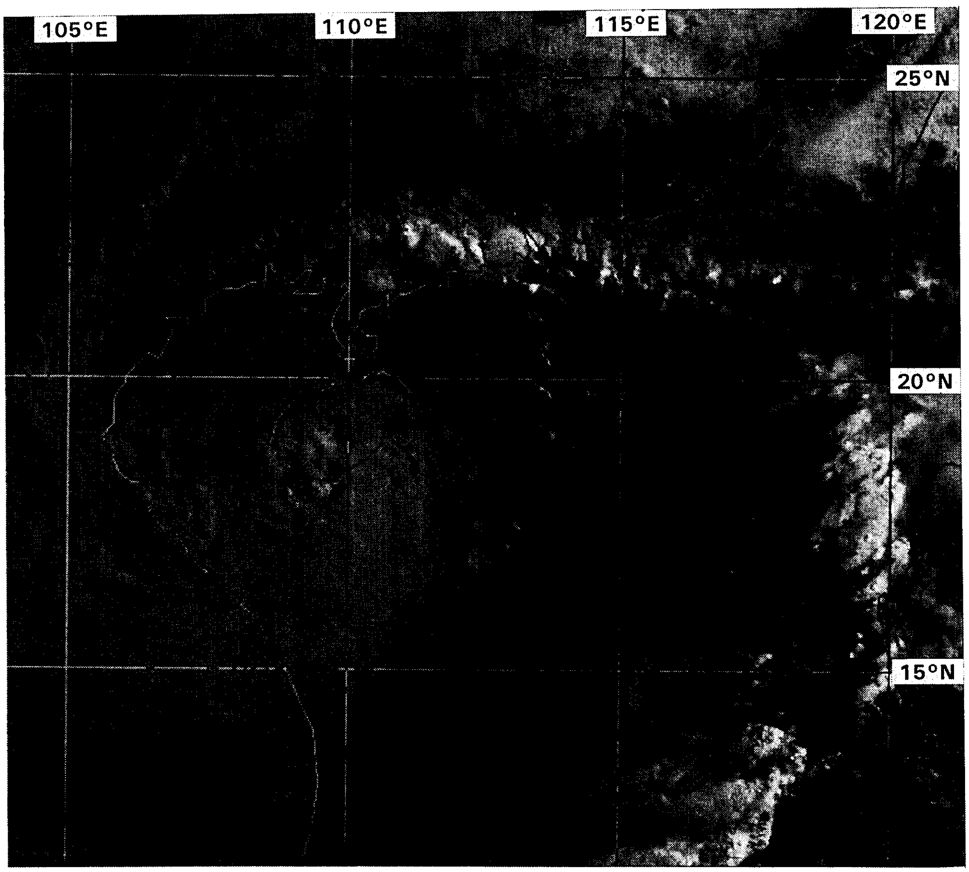


**Figure 7. GMS-4 visible imagery of Chuck at around 8 a.m. on 28 June 1992.**

**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. |

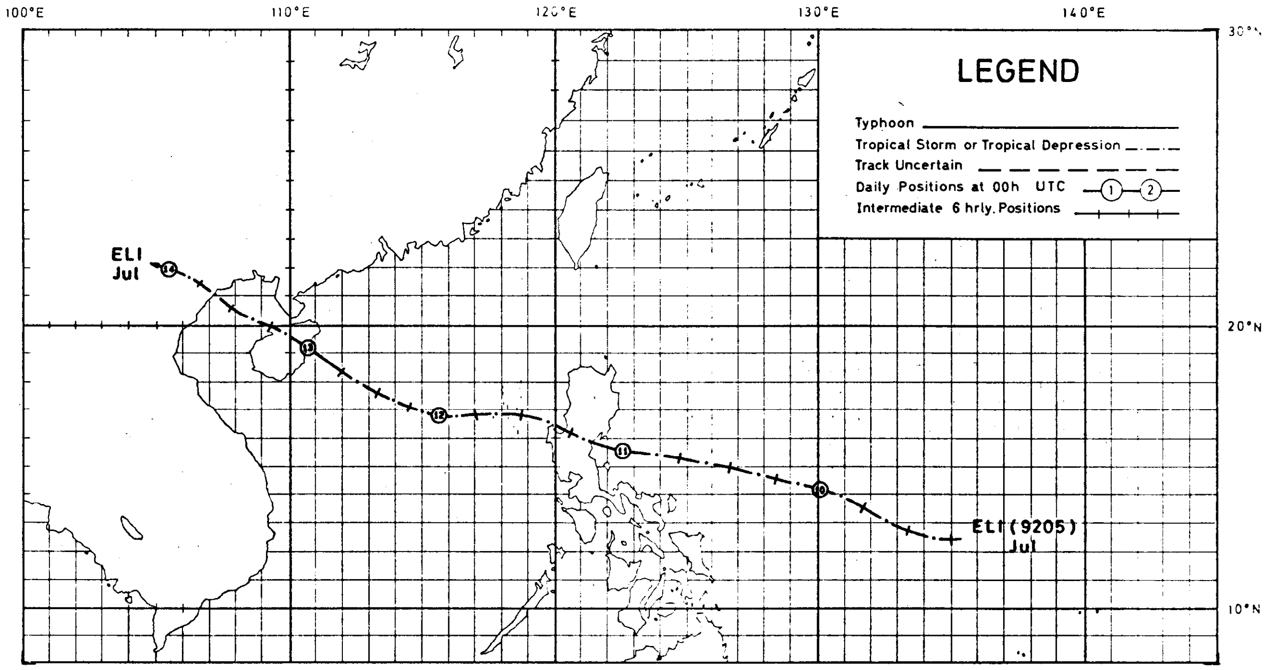


Figure 9. Track of Typhoon Eli (9205): 9-14 July 1992.

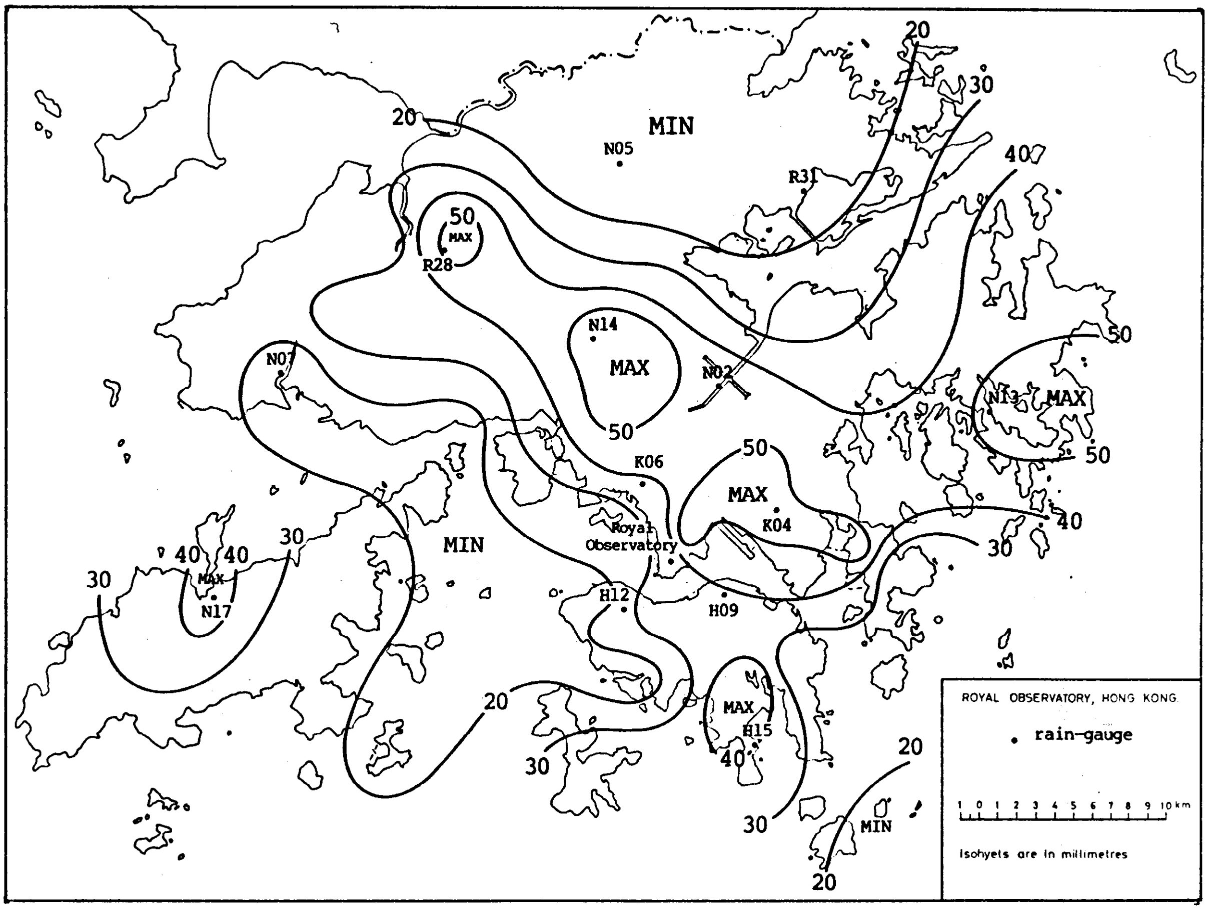


Figure 10. Rainfall (mm) distribution on 11-13 July 1992.

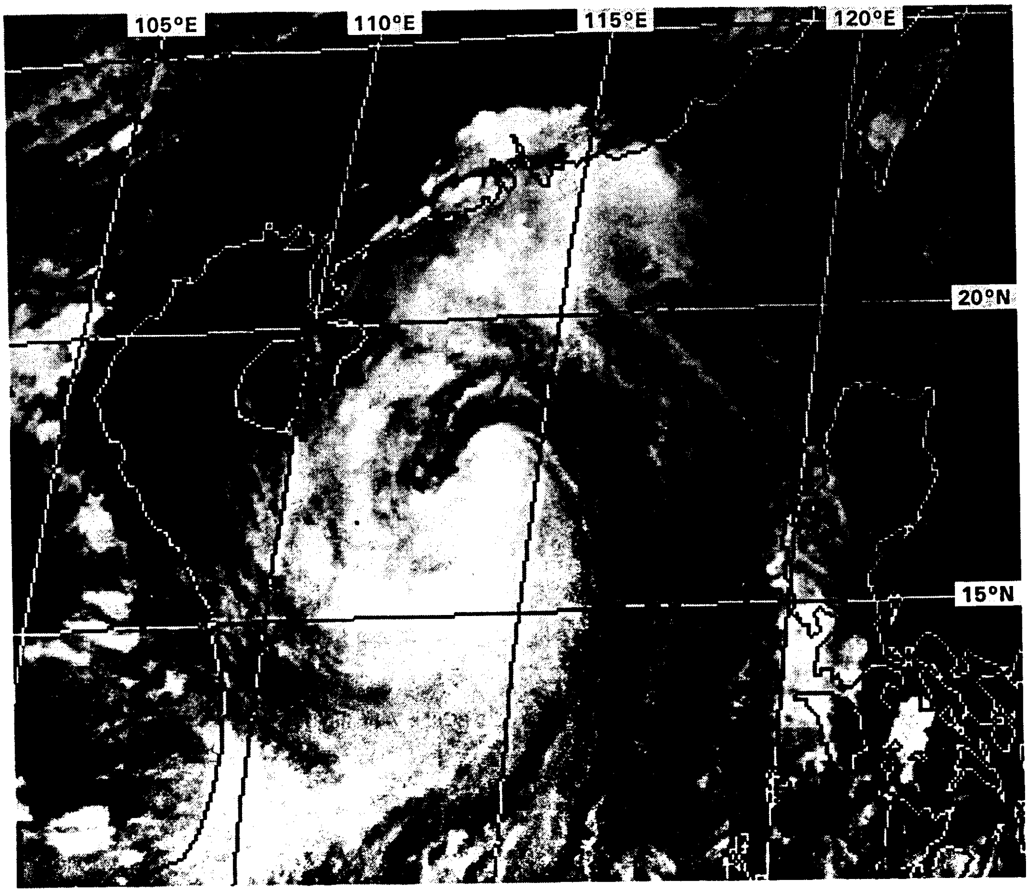


Figure 11. GMS-4 infra-red imagery of Eli at around 5 p.m. on 12 July 1992.

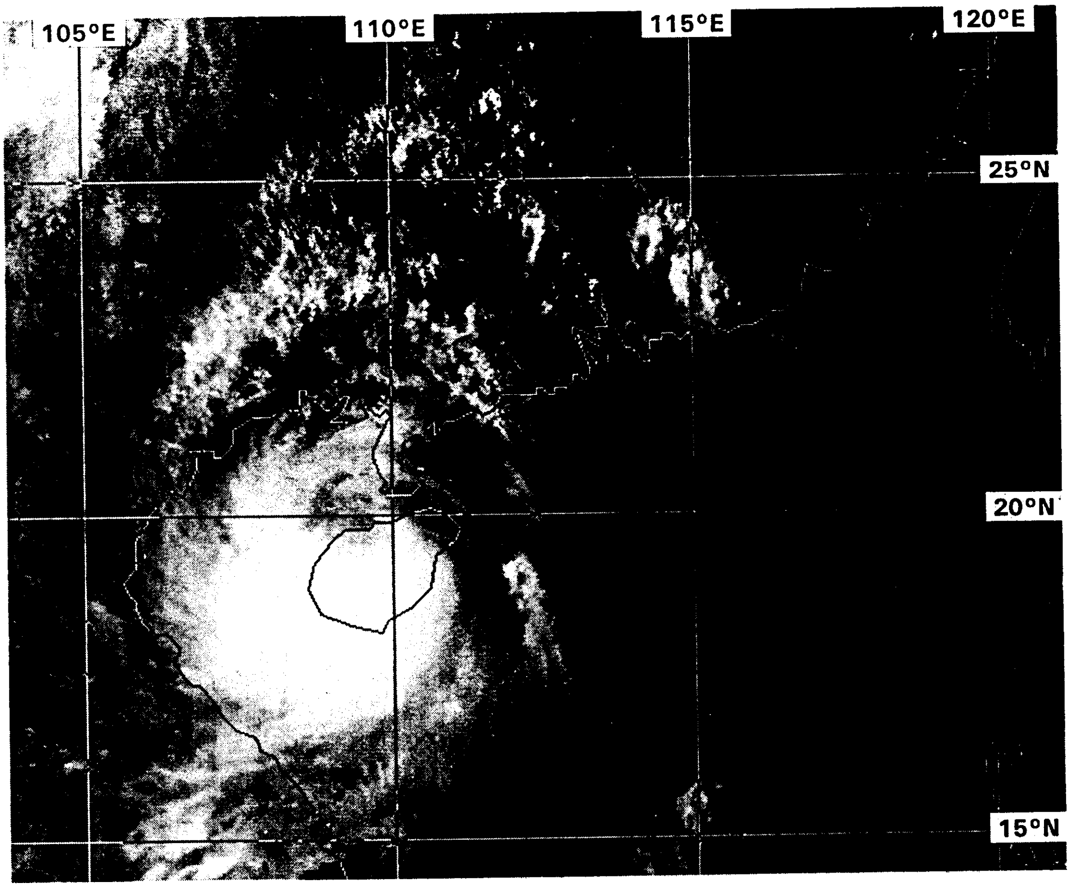


Figure 12. GMS-4 visible imagery of Eli at around 2 p.m. on 13 July 1992.

## (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* (see 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 Direction | Speed(km/h) | Date | Time | Maximum Hourly Wind 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. |

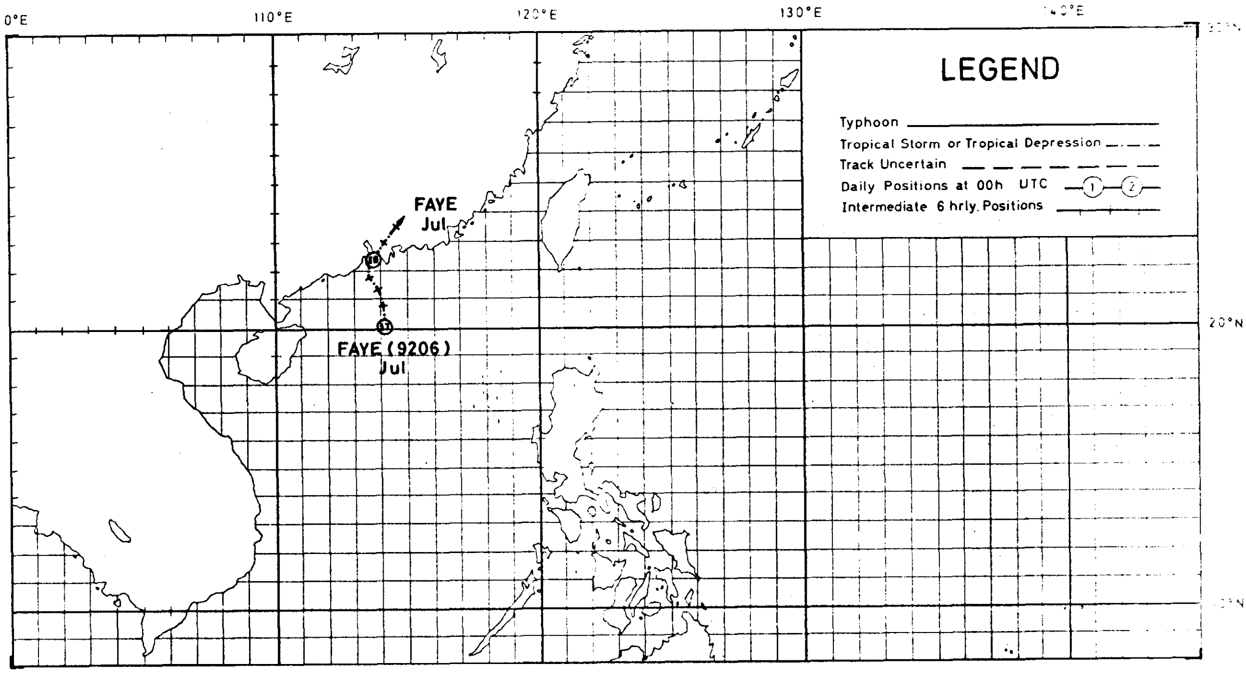


**Figure 13. Track of Tropical Storm Faye (9206): 17–18 July 1992.**

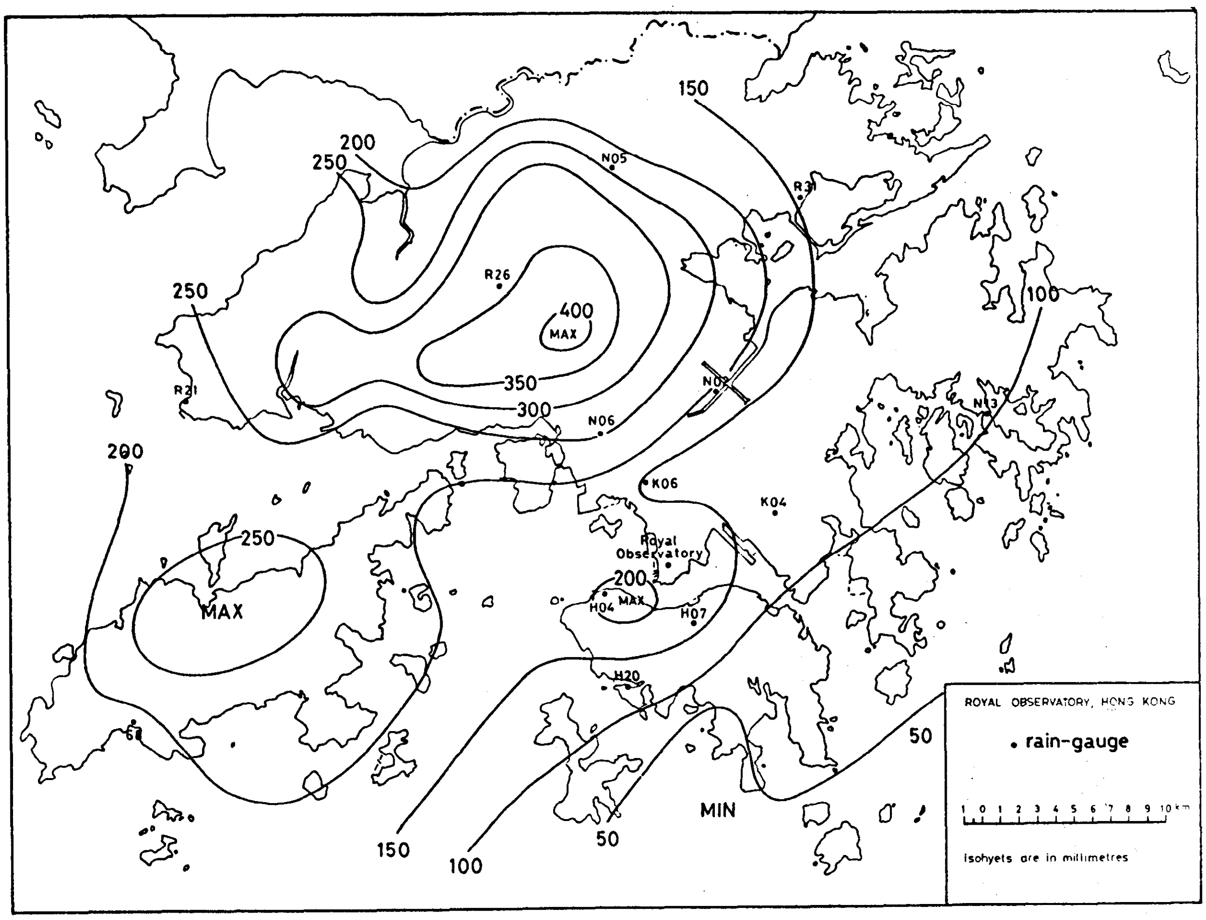


**Figure 14. Rainfall (mm) distribution on 17–18 July 1992.**

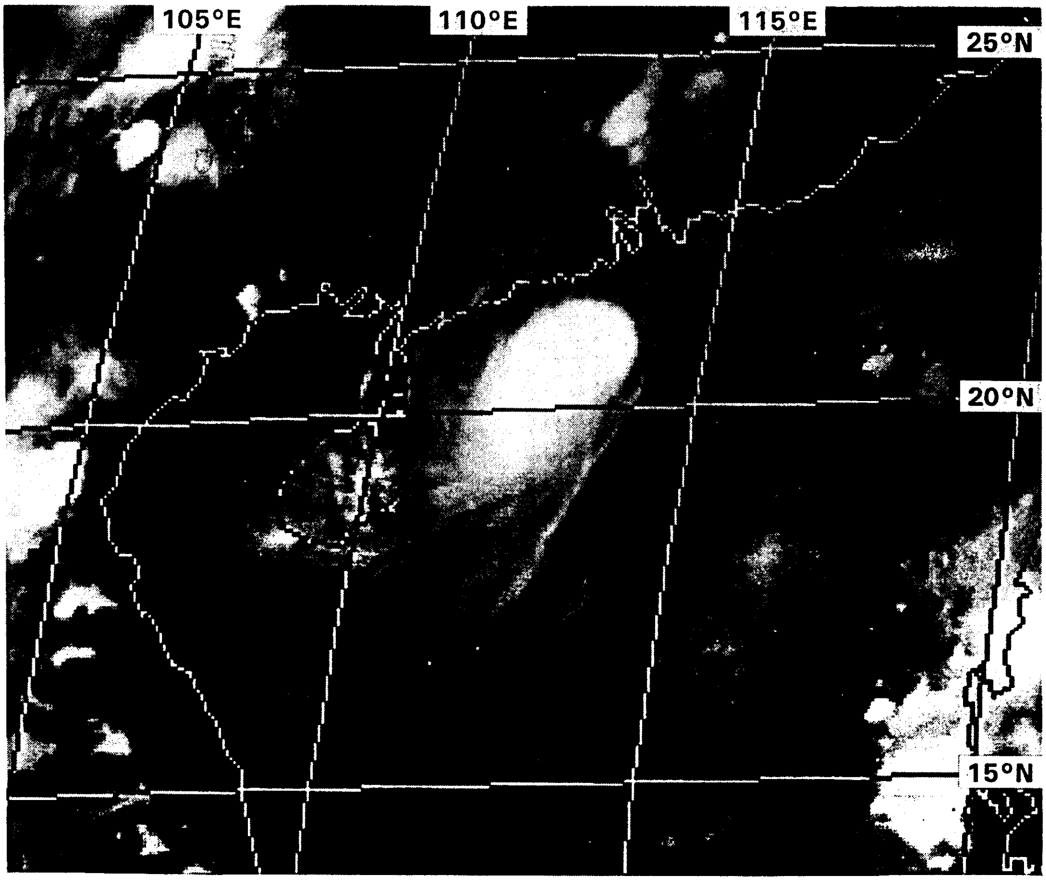


Figure 15. GMS-4 infra-red imagery of Faye at around 8 p.m. on 17 July 1992.

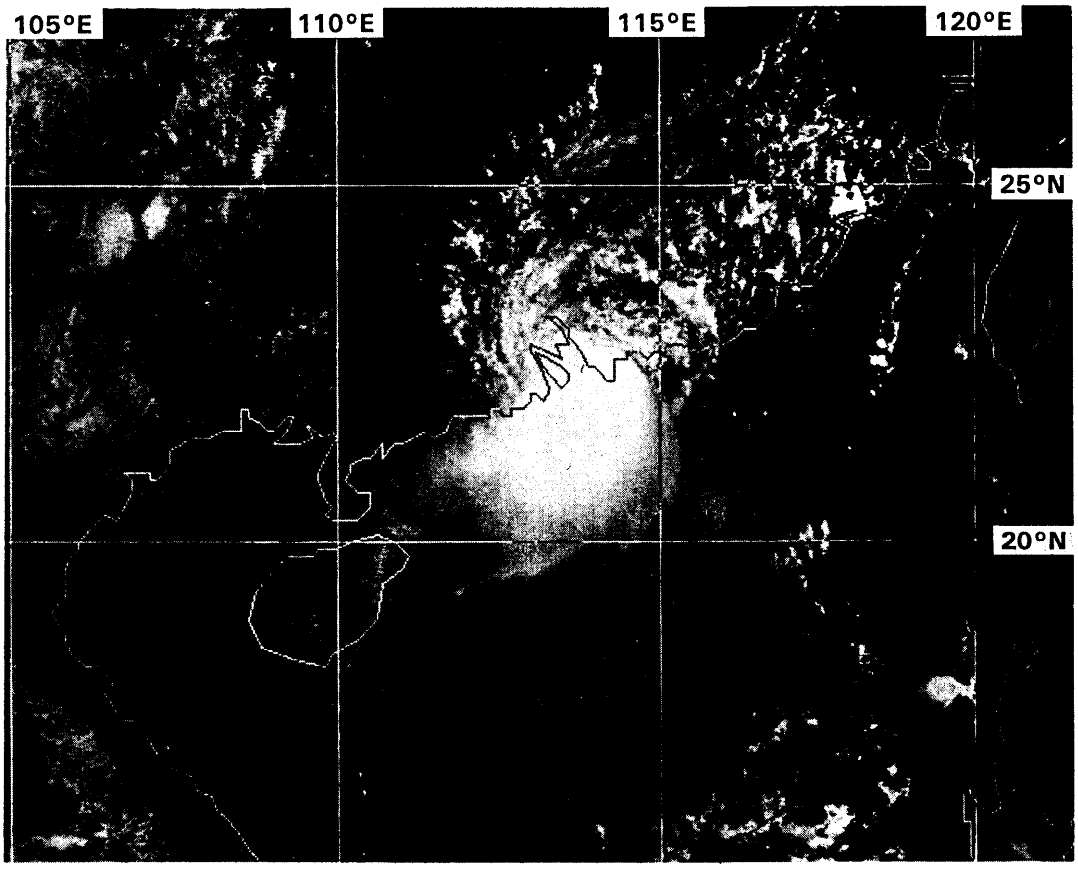


Figure 16. GMS-4 visible imagery of Faye at around 11 a.m. on 18 July 1992.

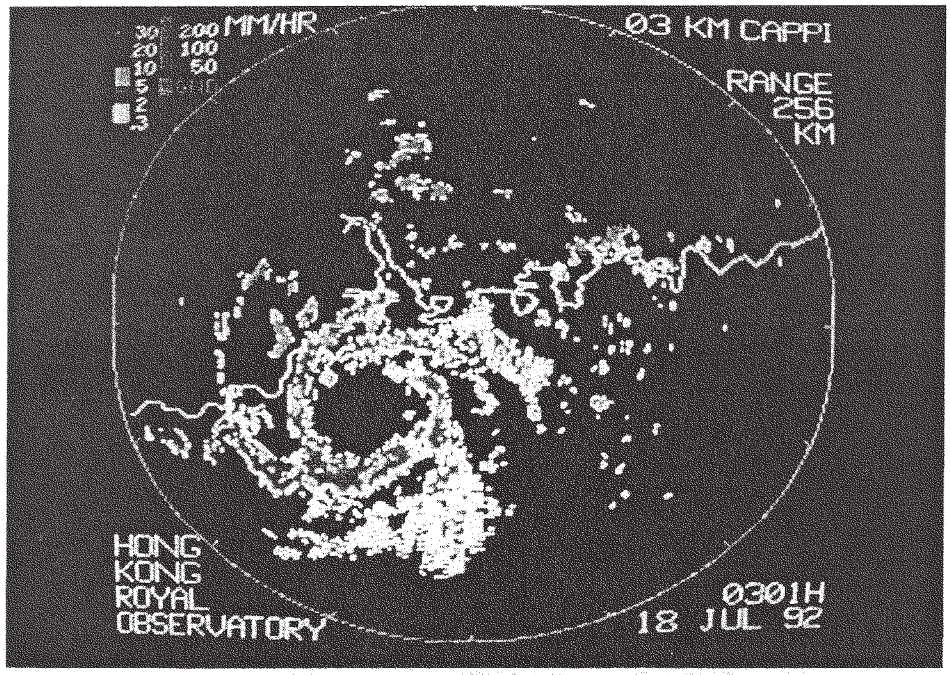


Figure 17. Radar display of the rain echoes of Faye at 3.01 a.m. on 18 July 1992.

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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).

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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. |

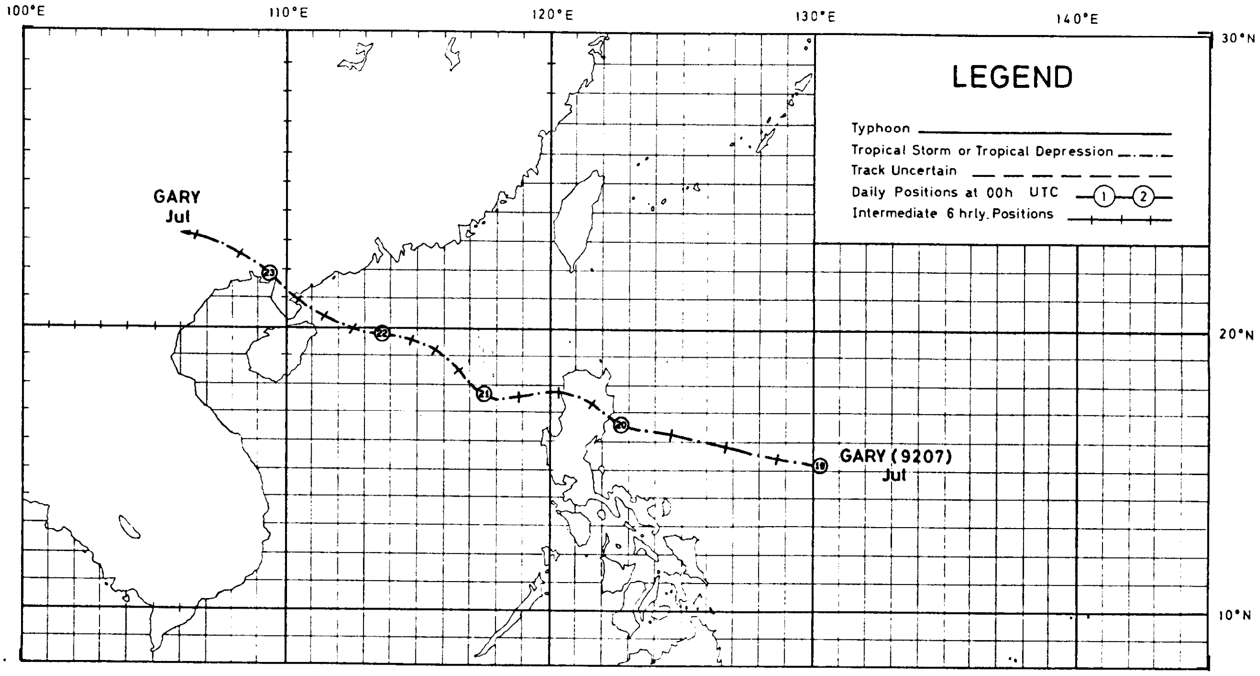


**Figure 22. Track of Severe Tropical Storm Gary (9207): 19–23 July 1992.**

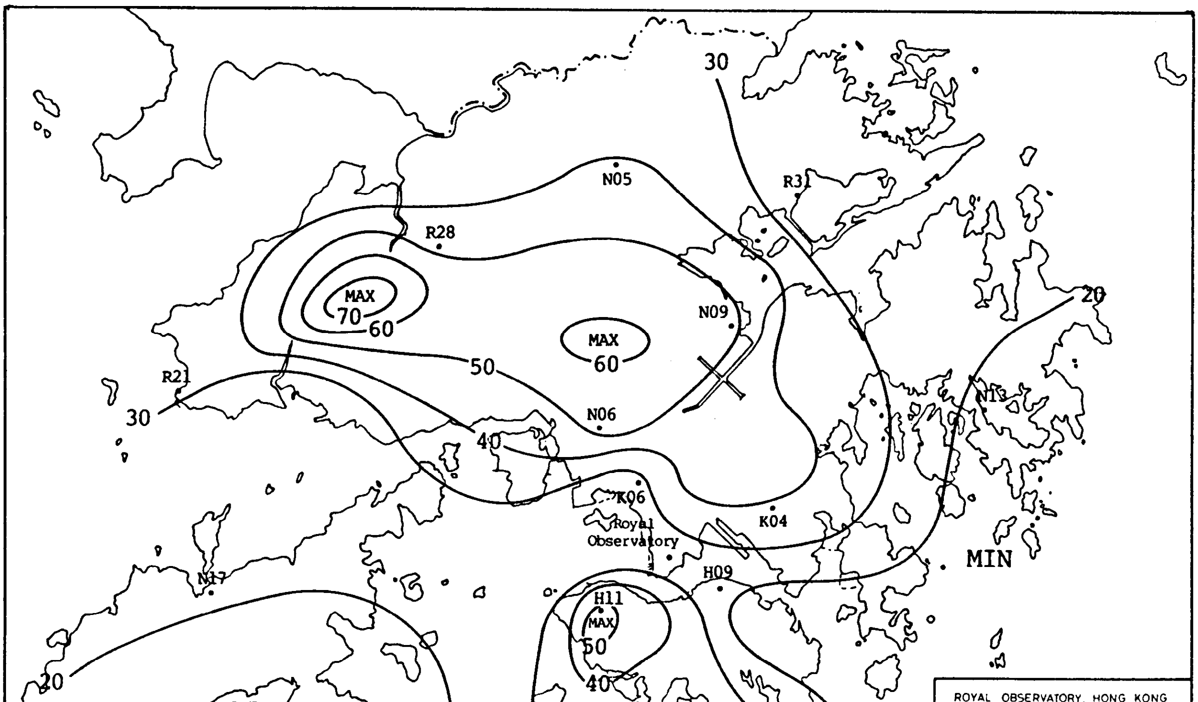


**Figure 23. Rainfall (mm) distribution on 20–23 July 1992.**

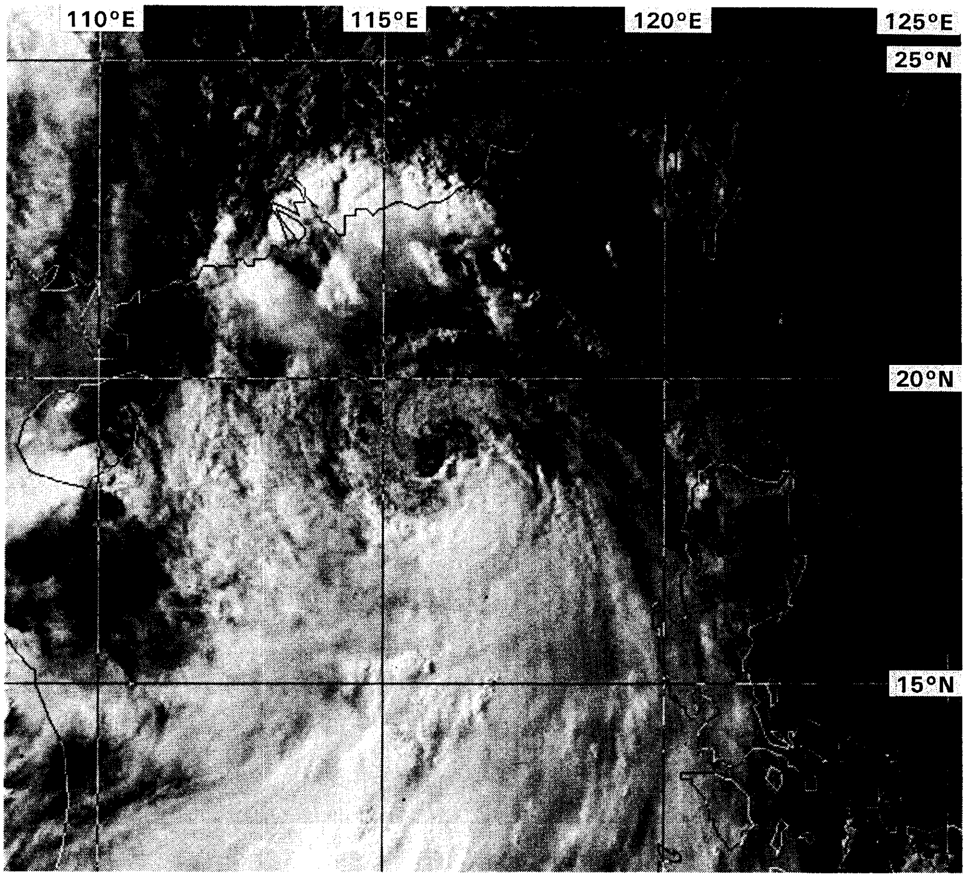


Figure 24. GMS-4 visible imagery of Gary at around 5 p.m. on 21 July 1992.

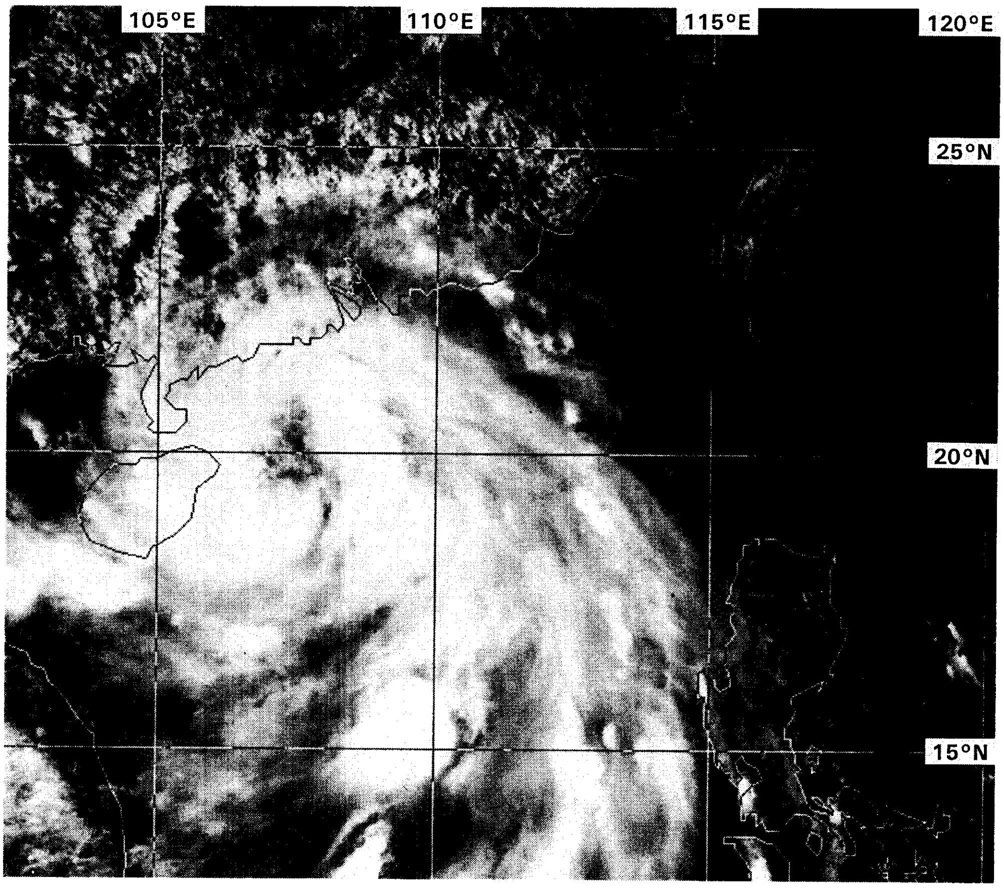


Figure 25. GMS-4 visible imagery of Gary at around 2 p.m. on 22 July 1992.

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

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

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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. |

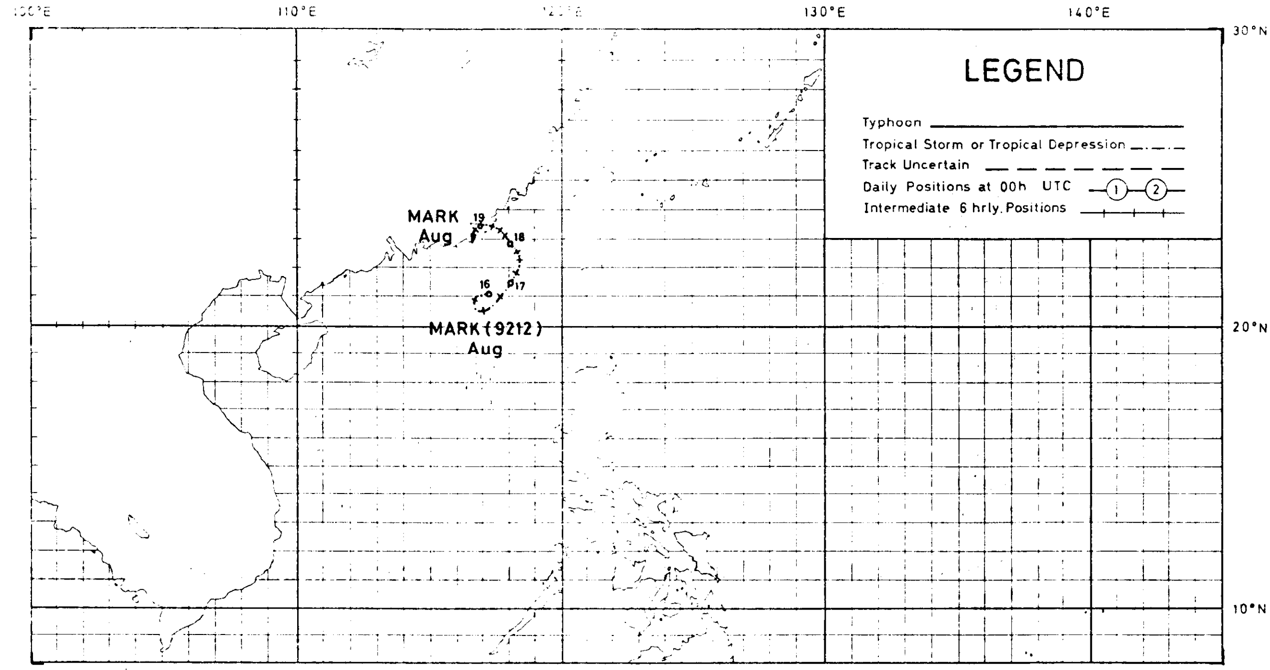


**Figure 29. Track of Tropical Storm Mark (9212): 16–19 August 1992.**

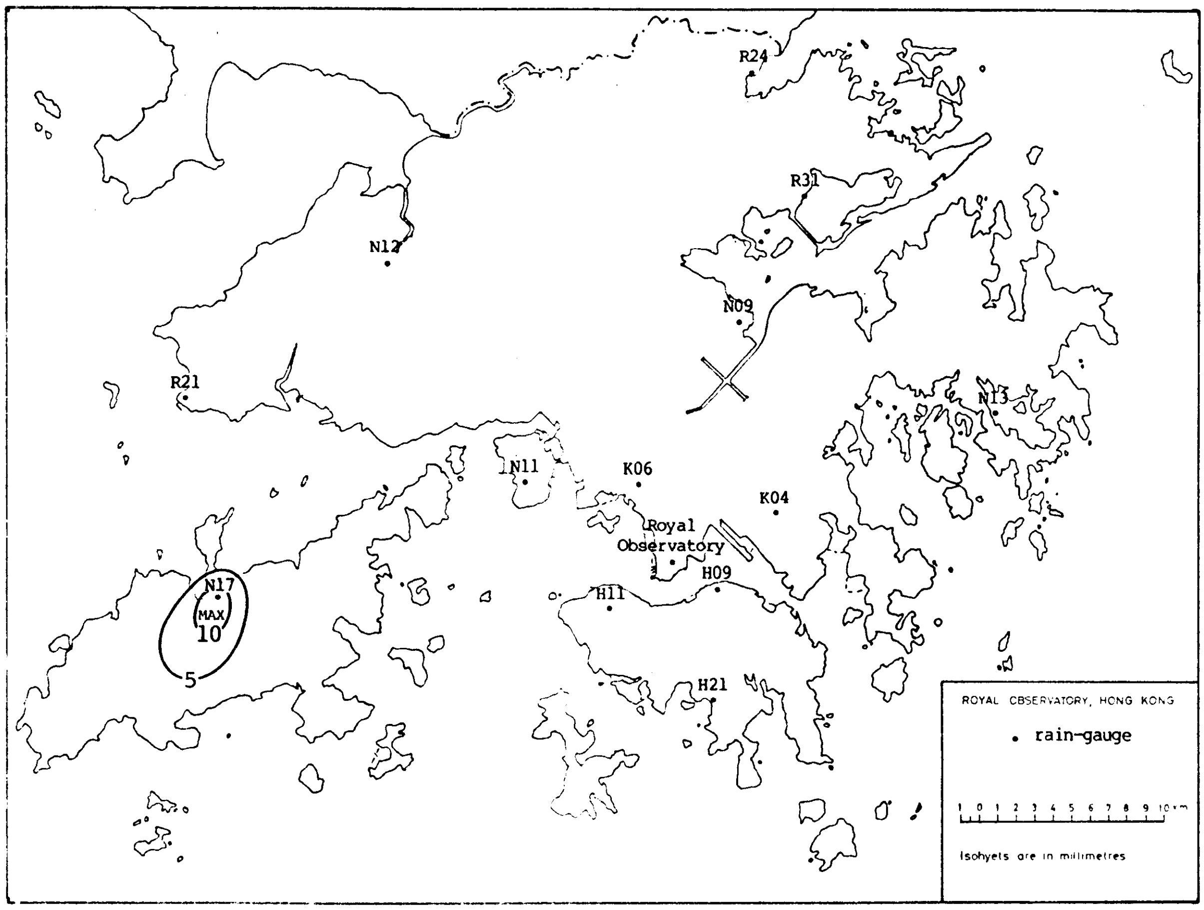


**Figure 30. Rainfall (mm) distribution on 16–17 August 1992.**

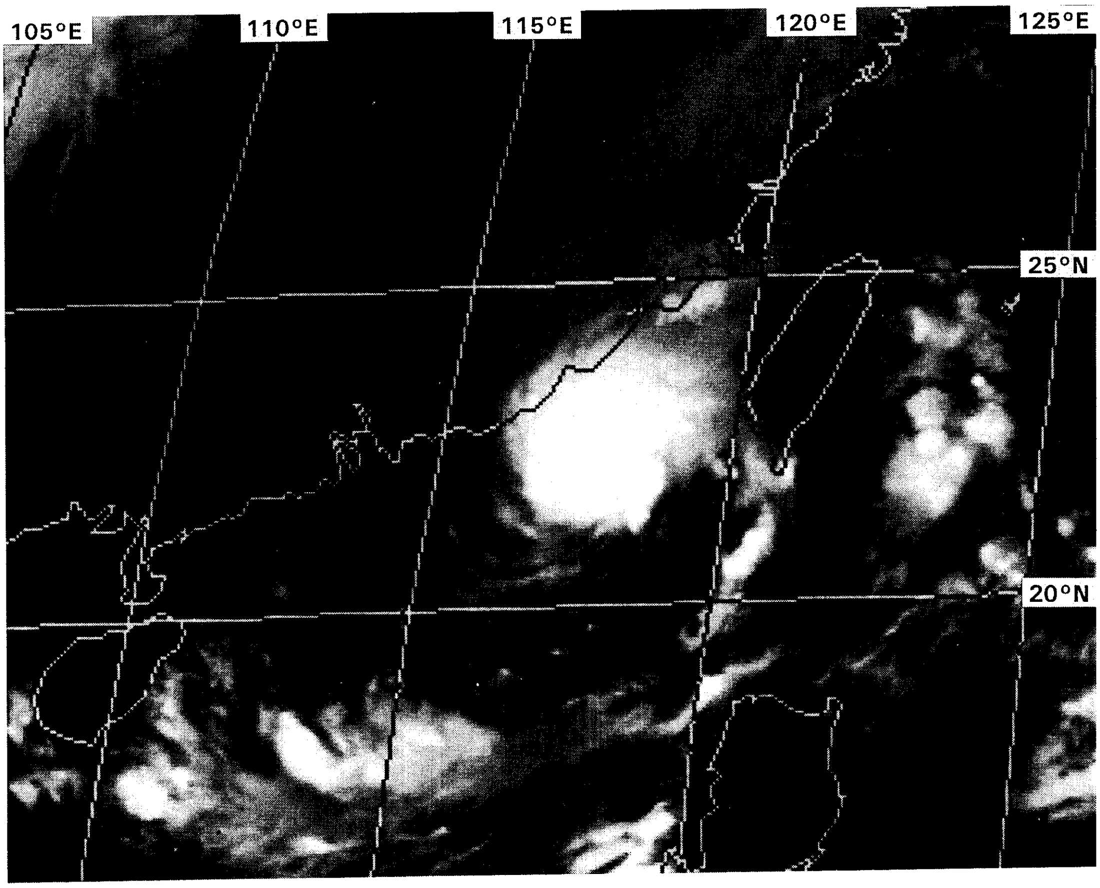


Figure 31. GMS-4 infra-red imagery of Mark at around 5 a.m. on 17 August 1992.

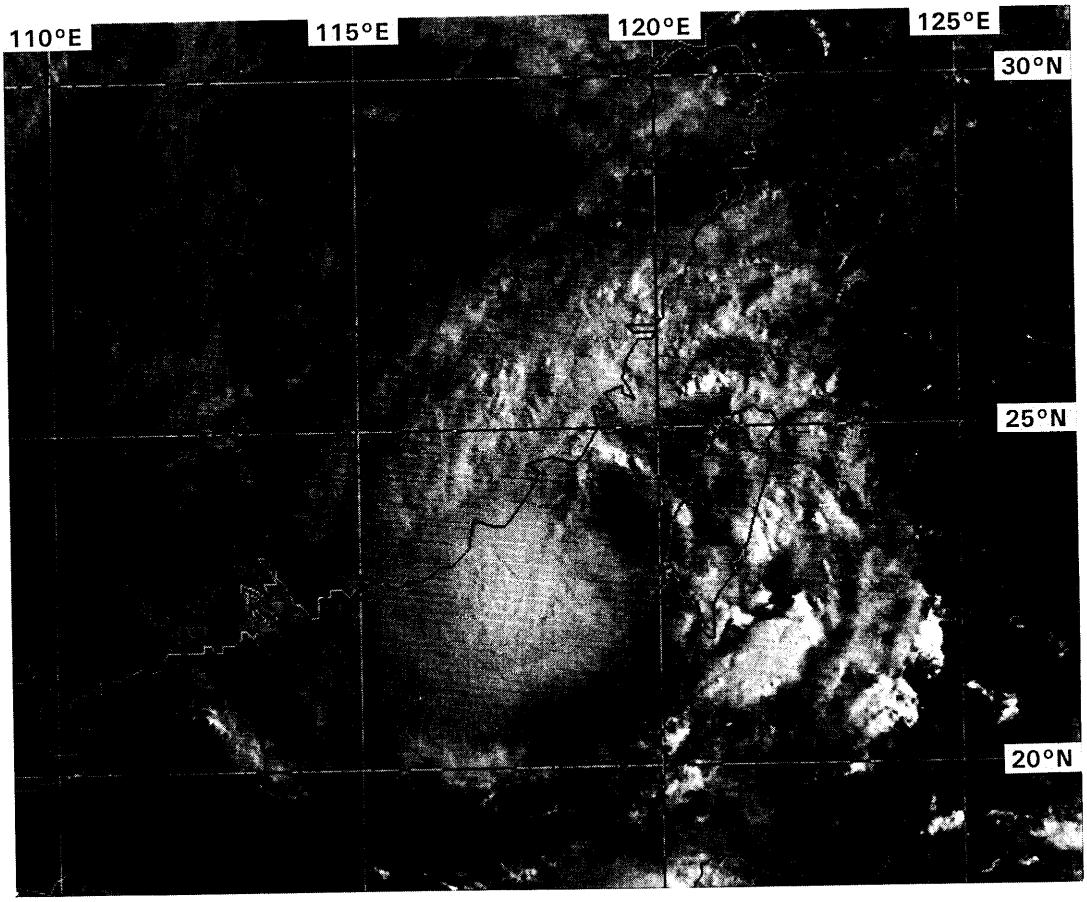


Figure 32. GMS-4 visible imagery of Mark at around 8 a.m. on 18 August 1992.

# 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, $45^{o}$N, $100^{o}$E and $180^{o}$). 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 $l0^{o}$N, $30^{o}$N, $105^{o}$E and $125^{o}$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 | Hoisted Time* | Lowered Date | Lowered 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

| Year \ Signals | 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) | | Maximum 60-min mean wind in points and km/h | | | | | | | | Maximum gust peak speed in km/h with direction in points | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Hourly | Inst. | Royal Observatory | Hong Kong Airport | Waglan Island | Cheung Chau | Tate's Cairn | Cape Collinson | Green Island | Castle Peak | 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<br>crops: 1000 tonnes<br>livestock: 20800 heads<br>pond fish: 100 tonnes | bridge: 1 site<br>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 | 33** | 303 | * | 110 | 5 | 286 |
| 1972 | 4 - 9 Nov | T. Pamela | 3 | 0 | 0 | 1 | 0 | 8 |
| 1973 | 14 - 20 Jul | T. Dot | 14 | * | * | 1 | 0 | 38 |
| 1974 | 7 - 14 Jun | T. Dinah | 1 | * | * | 0 | 0 | 0 |
| | 18 - 22 Jul | T. Ivy | 2 | * | * | 0 | 0 | 0 |
| | 15 - 19 Oct | T. Carmen | 5 | * | * | 1 | 0 | 0 |
| | 21 - 27 Oct | T. Della | 2 | * | * | 0 | 0 | 0 |
| 1975 | 10 - 14 Aug | T.D. | 3 | 1 | * | 2 | 1 | 0 |
| | 9 - 14 Oct | T. Elsie | 7 | 2 | 1 | 0 | 0 | 46 |
| | 16 - 23 Oct | S.T.S. Flossie | 1 | * | * | 0 | 0 | 0 |
| 1976 | 22 Jun - 4 Jul | T. Ruby | 0 | 0 | 0 | 3 | 2 | 2 |
| | 21 - 26 Jul | S.T.S. Violet | 0 | 0 | 0 | 2 | 1 | 1 |
| | 5 - 6 Aug | S.T.S. Clara | 0 | 0 | 0 | 0 | 0 | 4 |
| | 21 - 24 Aug | T.S. Ellen | 0 | 4 | 7 | 27 | 3 | 65 |
| | 15 - 21 Sep | T. Iris | 6 | 0 | 1 | 0 | 0 | 27 |
| 1977 | 4 - 6 Jul | T.D. | 0 | 0 | 0 | 0 | 0 | 2 |
| | 3 - 5 Sep | T.S. Carla | 1 | 0 | 0 | 0 | 0 | 1 |
| | 22 - 25 Sep | S.T.S. Freda | 2 | 0 | 0 | 1 | 0 | 37 |
| 1978 | 24 - 30 Jul | S.T.S. Agnes | 0 | 25 | 42 | 3 | 0 | 134 |
| | 9 - 12 Aug | T.S. Bonnie | 2 | 0 | 0 | 0 | 0 | 0 |
| | 23 - 28 Aug | S.T.S. Elaine | 8 | 5 | 8 | 1 | 0 | 51 |
| | 22 - 26 Sep | S.T.S. Kit | 0 | 1 | 0 | 0 | 7 | 0 |
| | 7 - 16 Oct | S.T.S. Nina | 0 | 0 | 0 | 0 | 0 | 2 |
| | 17 - 29 Oct | T. Rita | 1 | 5 | 0 | 0 | 0 | 3 |
| 1979 | 1 - 6 Jul | T. Ellis | 0 | 2 | 0 | 0 | 0 | 0 |
| | 26 - 30 Jul | T.S. Gordon | 0 | 2 | 0 | 0 | 0 | 0 |
| | 28 Jul - 3 Aug | T. Hope | 29 | 167 | 207 | 12 | 0 | 260 |
| | 6 - 9 Aug | T.D. | 0 | 3 | 0 | 0 | 0 | 0 |
| | 16 - 24 Sep | S.T.S. Mac | 2 | 12 | 0 | 1 | 0 | 67 |
| 1980 | 5 - 12 Jul | S.T.S. Ida | 1 | 0 | 0 | 0 | 0 | 0 |
| | 18 - 23 Jul | T. Joe | 4 | 0 | 1 | 2 | 1 | 59 |
| | 20 - 28 Jul | T. Kim | 0 | 2 | 1 | 0 | 0 | 0 |
| | 29 Oct - 2 Nov | T.S. Cary | 0 | 0 | 2 | 0 | 0 | 0 |

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

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

# 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