

By fax (2721 6557)

CB1/PL/ES

2869 9577

2121 0420

28 July 2001

Dr H K LAM, JP
Director of the Hong Kong Observatory
134A Nathan Road,
Tsim Sha Tsui,
Kowloon.

Dear Dr LAM,

Legislative Council Panel on Economic Services

Typhoon Yutu

I write to you, in my capacity as the Chairman of the Legislative Council Panel on Economic Services, concerning the quality of weather information services.

Whilst appreciating the need for the Administration to provide weather forecasts and issue warnings to the public, special users, the shipping community, aircraft and aviation groups in order to reduce loss of life and damage to property during hazardous weather, the reliability and accuracy of such weather forecasting and warning systems are of equal importance, bearing in mind the possible disruptions to the community and economic activities when Typhoon Signal No. 8 is in force.

Hong Kong was under the influence of Typhoon Yutu during the period from 24 to 25 July 2001. The No. 8 Storm Signal was first hoisted at 12:30 am on 25 July 2001 and remained in force for more than 19 hours. The No. 3 strong wind signal replaced the No. 8 Storm Signal at 7:40 pm on 25 July 2001. It was reported that only minor incidents were recorded under the No. 8 signal. No cases of flooding and landslip were reported in Hong Kong.

The authorities of our neighboring cities such as Macau, Shenzhen and Zhuhai also had not issued such a severe warning to the public as that in Hong Kong.

In view of the possible disruptions to the community and economic activities, I should be grateful if you would review the reliability and accuracy of the weather forecasting and warning systems. I should also be grateful if you would give an account of your decision to continue hoisting the No. 8 Storm Signal for more than 19 hours on 25 July 2001.

With best regards,

Yours sincerely,

(James TIEN)

Chairman of the Panel on Economic Services

c.c. Secretary for Economic Services

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By Fax and By Post

10 August 2001

The Honourable James Tien Pei-chun, JP
Chairman of the Panel on Economic Services
Legislative Council Building
8 Jackson Road
Central
Hong Kong

[Fax : 2121 0420 – total 8 pages]

Dear Honourable Mr Tien,

**Legislative Council Panel on Economic Services
Typhoon Yutu**

Thank you for your letter of 28 July 2001 on Typhoon Yutu.

———— I would like to respond to your letter under the following headings in the Annex:-

- (1) Why was No. 8 hoisted;
- (2) Why was No. 8 hoisted for 19 hours; and
- (3) Weather forecasting and warning systems.

Whilst I, and indeed all Observatory staff, will endeavour to improve on the accuracy of tropical cyclone forecasting in order to better pinpoint their future positions in cooperation with the international community, present day science and technology do have their limits. I believe that, under the circumstances and having made the best use of existing technology, it was necessary to hoist No. 8 for the entire period. I regret the disruptions to the community and economic activities during Typhoon Yutu, but public safety is our paramount consideration.

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I would like to take this opportunity to invite you to visit the Observatory so that we could further explain our operations and also exchange views on the operation of the tropical cyclone warning system. If this is agreeable, perhaps your assistant would like to contact Mr K H Yeung, my Assistant Director (tel: 2926 8222), to arrange a mutually convenient time for the visit.

Yours sincerely,

(C Y Lam)
Acting Director of the Hong Kong Observatory

Encl

cc Secretary for Economic Services

(1) Why was No. 8 hoisted

Forecast wind condition over Hong Kong is the basis to determine the tropical cyclone signal to be hoisted. The No. 8 signal will be hoisted when gale or storm force wind is expected or blowing in the Victoria Harbour, with a sustained wind speed of 63 - 117 kilometres per hour (km/h). Whilst all factors will be taken into account in considering signal changes, public safety is the prime concern.

Fig 1

Fig 1 shows the past track (black) of Yutu up to midnight on 24 July 2001 and the then forecast track (dashed green) around midnight on 24 July 2001 based on information available at the time. The forecast track would take Yutu to within 150 km of Hong Kong. As gale force winds (63 – 117 km/h) were observed on the Observatory's Doppler radar to affect areas within 160 km of Yutu, and during the previous 3 hours, Yutu had been intensifying with maximum winds increasing from 120 km/h to 150 km/h, there was a high probability that Hong Kong would be affected by gale force winds. The No. 8 signal was therefore hoisted at 0030 hours on 25 July 2001.

Fig 2

Fig 2 is similar to Fig 1 but shows also the actual track of Yutu after midnight on 24 July up to landfall. Yutu moved slightly further west before turning to west-northwest as forecast. It was 180 km from Hong Kong at its closest just before noon on 25 July. There was a discrepancy of 30 km but this was well within the typical forecast error margin of 150-200 km in 24 hours of international centres.

(2) Why was No. 8 hoisted for 19 hours

Fig 3

Although Yutu was 30 km further away from Hong Kong than expected, the gale force winds of Yutu in actual fact did come close and affect the southern part of Hong Kong including Cheung Chau and Shek Kwu Chau for 11 hours beginning around 0700 hours on 25 July. Fig 3 shows the area affected by gale force winds during this period. The track shaded in light red in Fig 2 shows the positions of Yutu when gale force winds were experienced in the southern part of Hong Kong.

During the period, we considered that:-

- (a) gale force winds were already affecting parts of Hong Kong, practically at the doorstep of Victoria Harbour where the criteria of wind speed for No. 8 signal is based;
- (b) all objective forecasting tools at the time still indicated a possible change of course to more west-northwest, edging Yutu closer and the gale force winds further into the territory;
- (c) Yutu was still an intense typhoon with no signs of weakening. It had been slowing down and would be within 200 km of Hong Kong for a prolonged period of time.

Yutu was thus still posing a serious threat to Hong Kong. A change to lower signals would convey a false message to the public that the threat of Yutu to Hong Kong was over. We therefore exercised prudence and kept No. 8 hoisted although the No. 8 criteria for wind speed in Victoria Harbour was not yet reached.

This situation remained largely unchanged until around 1800 hours on 25 July when winds over the southern part of Hong Kong showed first signs of easing off, and Yutu began to move away from Hong Kong. The No. 8 signal was replaced by No. 3 at 1940 hours on 25 July.

(3) Weather forecasting and warning systems

Weather forecasts are made based on data such as surface and upper-air observations, satellite and radar information and results of computer simulations of the atmosphere using these data as input. The Observatory collects data using the best equipment which is affordable. Using the data collected locally and from overseas, we employ forecasting tools adapted from other international centres as well as tools which are developed in-house specific to the Hong Kong situation to prepare forecasts. In spite of all these, the science of meteorology is still imperfect, and the accuracy of forecasts suffers from the scarcity of data over the sea particularly to the south of Hong Kong. It is still not possible to 100% pinpoint the exact positions of tropical cyclones in the future or to forecast with absolute accuracy the weather in small areas in the tropics like Hong Kong. Meteorologists worldwide, including those in Hong

Kong, are working to find new methods and improve existing ones to solve these problems.

No warning system is perfect. The warning systems used in Hong Kong are operated based on weather data and forecasts. Bearing in mind the crucial consideration of public safety, and in the face of the needs of the community, we have introduced the following measures to our systems -

- (a) the public is informed in advance of likely changes in warning status, as far as possible;
- (b) more information is supplied to the public through more frequent media briefings and a diversity of other means including the Internet;
- (c) closer liaison with public transport operators and other government departments are made to enable them to act promptly in changing situations.

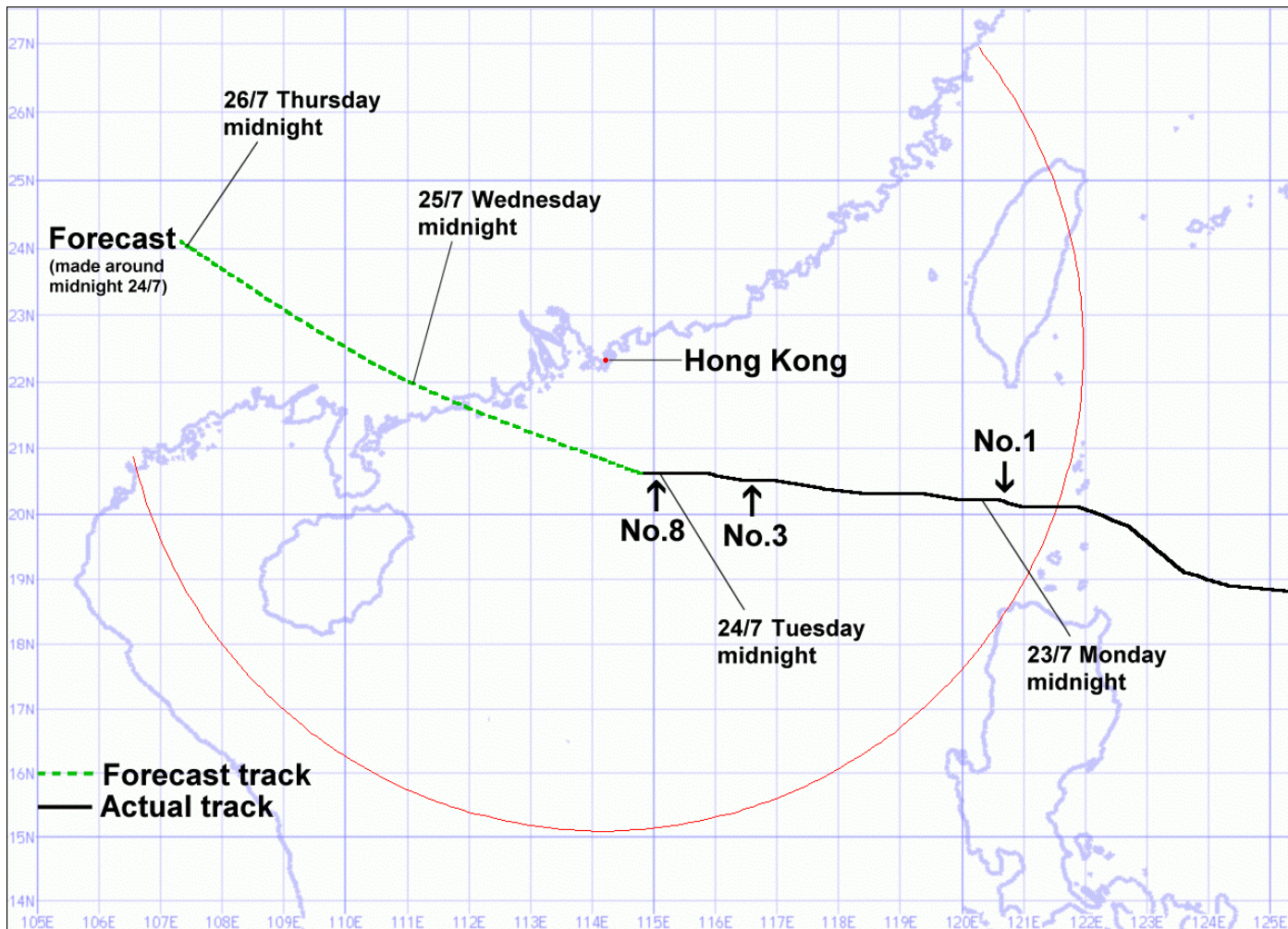


Figure 1 The track of Typhoon Yutu up to midnight on 24 July 2001 and the then forecast track.

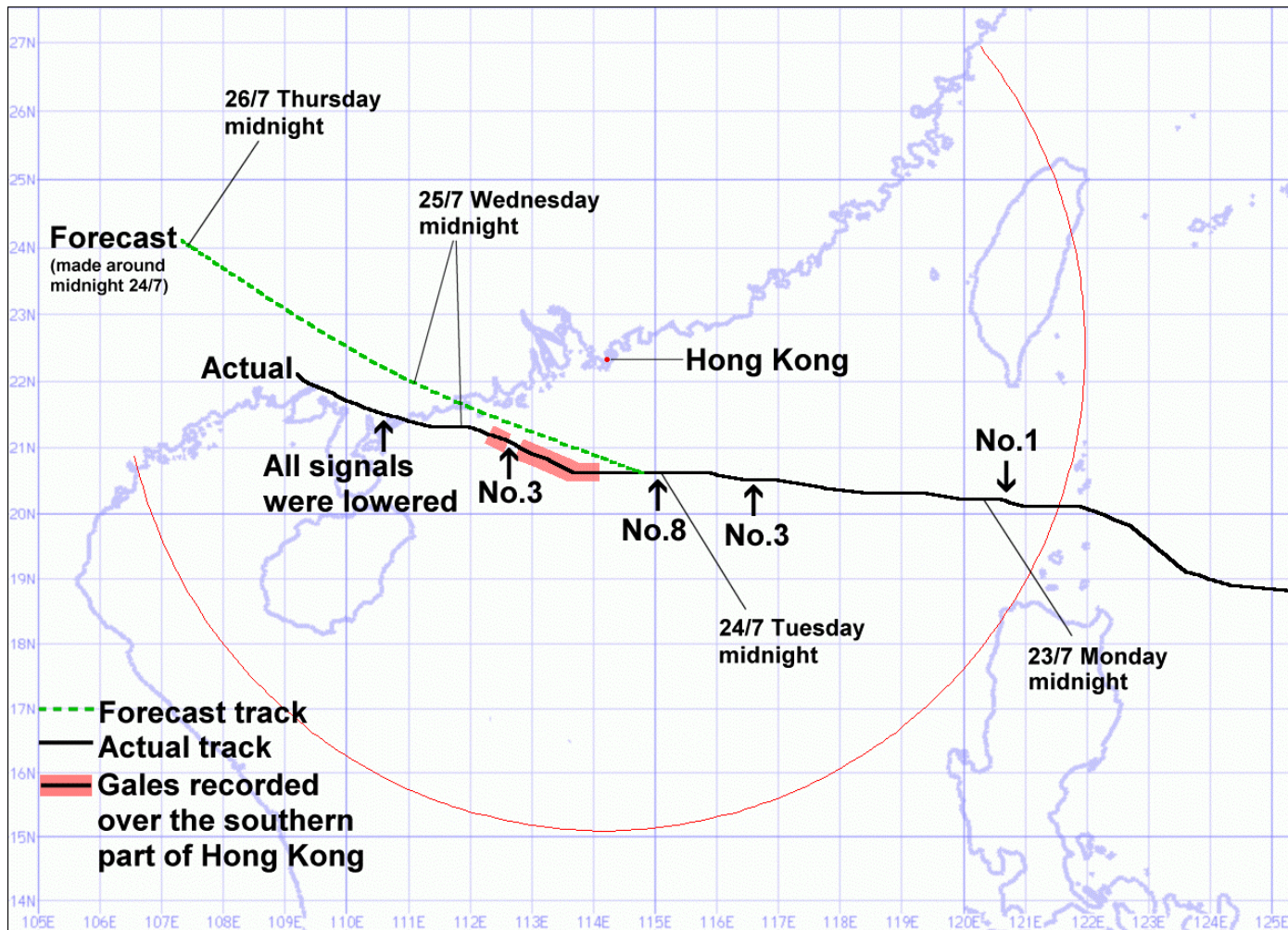


Figure 2 The track of Typhoon Yutu versus the forecast made around midnight on 24 July 2001.

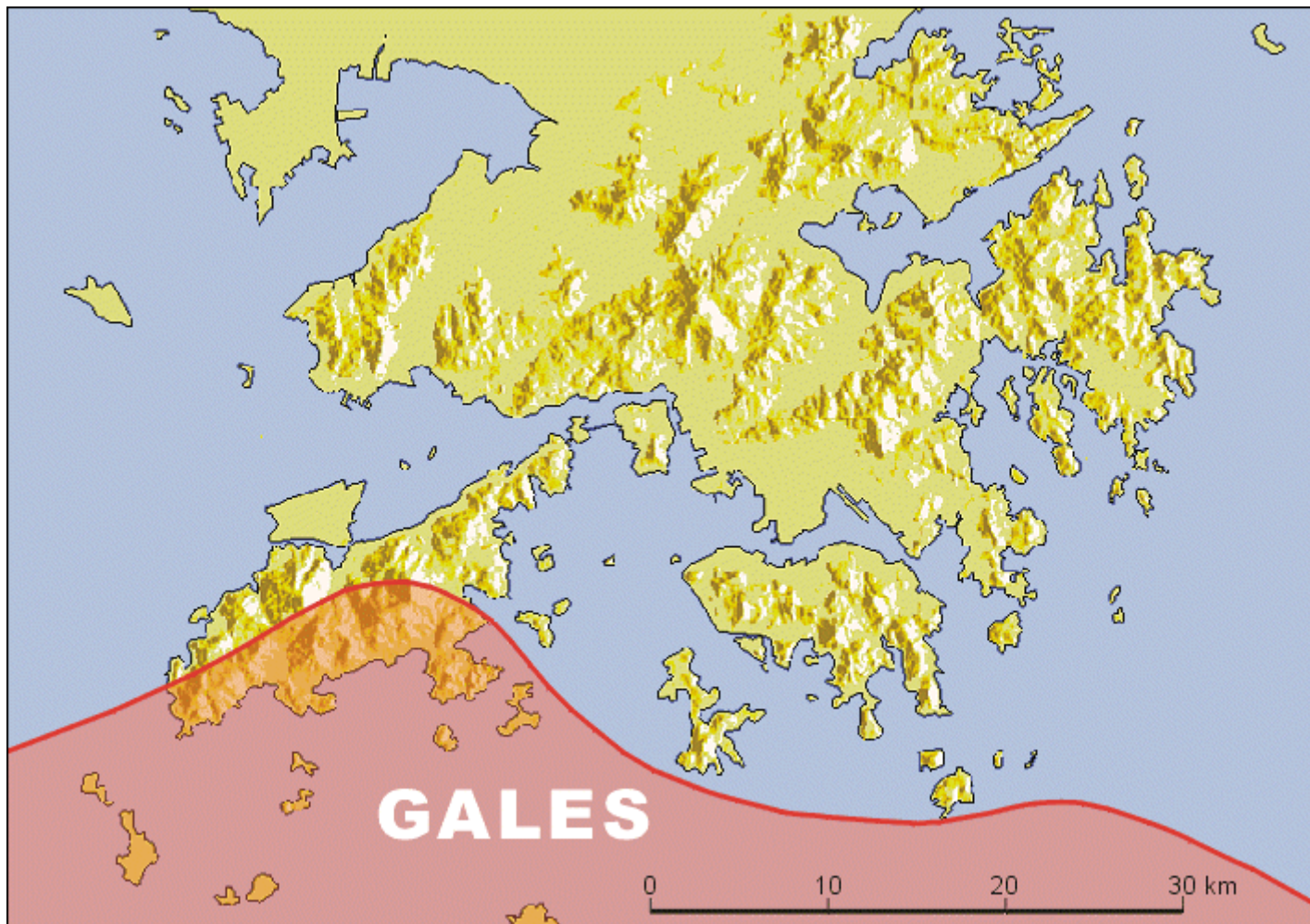


Figure 3 Areas affected by gale force winds during the passage of Typhoon Yutu.