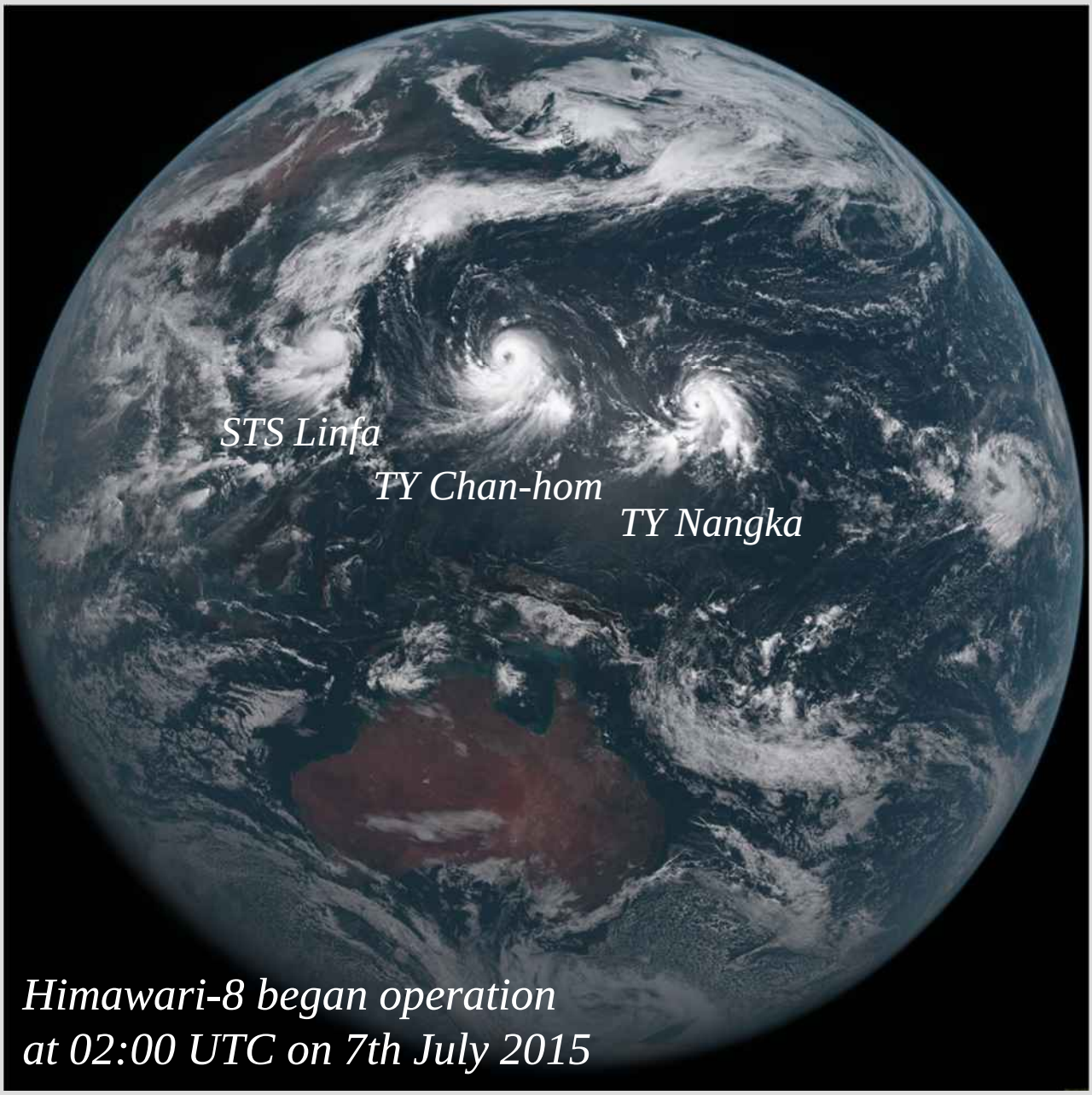
# Annual Report on the Activities of the RSMC Tokyo - Typhoon Center 2015




**Japan Meteorological Agency**

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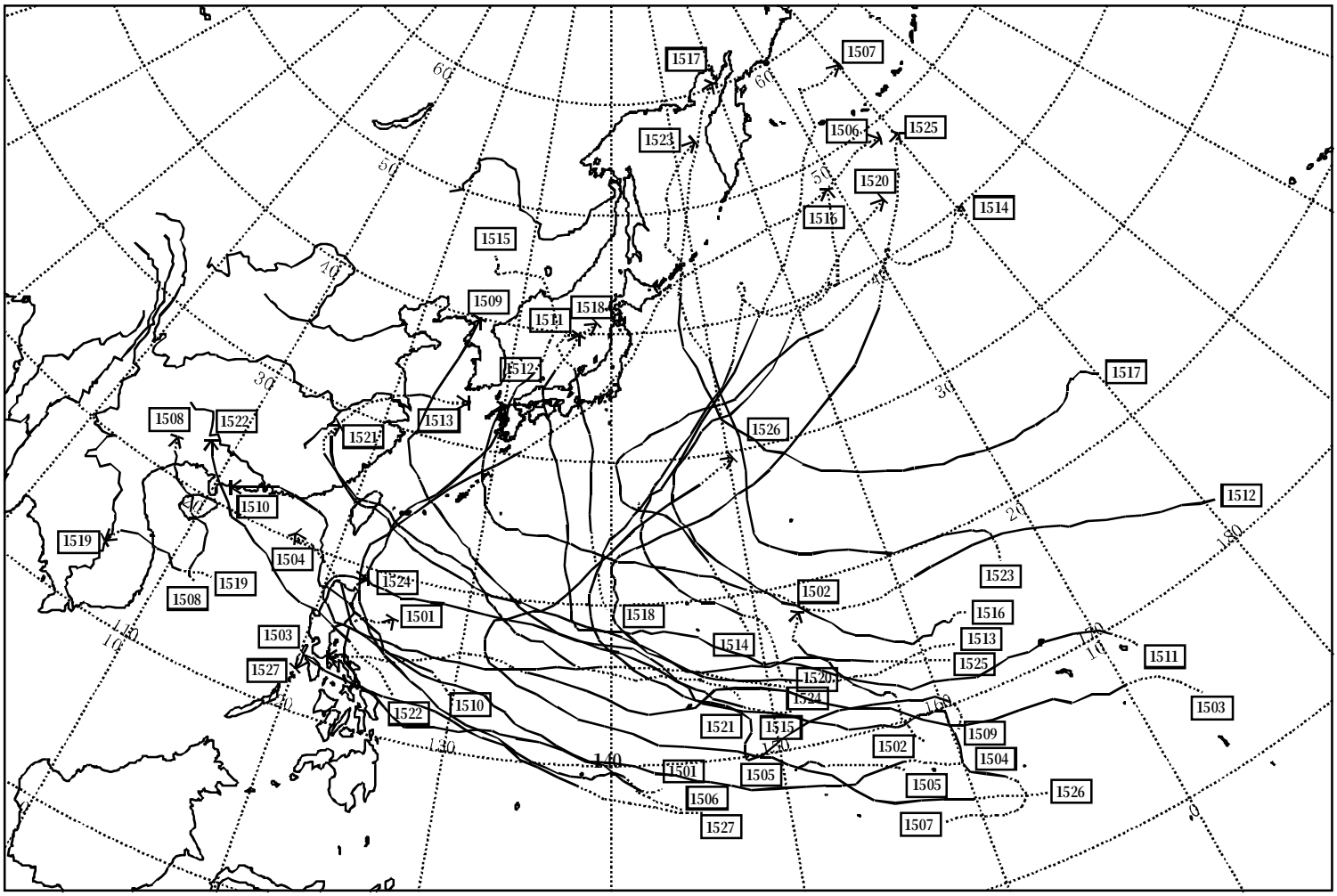
# on the Activities of
# the RSMC Tokyo - Typhoon Center
# 2015




Japan Meteorological Agency

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**DVD for Annual Report 2015**

# Introduction

The RSMC Tokyo - Typhoon Center (referred to here as *the Center*) is a Regional Specialized Meteorological Centre (RSMC) that carries out specialized activities in analysis, tracking and forecasting of western North Pacific tropical cyclones (TCs) within the framework of the World Weather Watch (WWW) Programme of the World Meteorological Organization (WMO). The Center was established at the headquarters of the Japan Meteorological Agency (JMA) in July 1989 following a designation by the WMO Executive Council at its 40th session (Geneva, June 1988).

The Center conducts the following operations on a routine basis:

(1) Preparation of information on the formation, movement and development of TCs and associated meteorological phenomena
(2) Preparation of information on synoptic-scale atmospheric situations that affect the behavior of TCs
(3) Provision of the above information to National Meteorological Services (NMSs), and in particular to ESCAP/WMO Typhoon Committee Members, in appropriate formats for operational processing

In addition to the routine services outlined above, the Center distributes a series of reports entitled *Annual Report on the Activities of the RSMC Tokyo - Typhoon Center* as operational references for the NMSs concerned. The reports summarize the activities of the Center and review the TCs of the preceding year.

In this issue covering 2015, Chapter 1 outlines routine operations performed at the Center and its operational products, while Chapter 2 reports on its major activities in 2015. Chapter 3 describes atmospheric and oceanic conditions in the tropics and notes the highlights of TC activity in 2015. In Chapter 4, verification statistics relating to operational forecasts and the results of the Center's numerical weather prediction (NWP) models are presented. Verification statistics relating to storm surge prediction will also be outlined in this chapter. Best track data for 2015 TCs are shown in table and chart form in the appendices. All relevant text, tables, charts and appendices are included on the DVD provided with this report.

The DVD contains hourly cloud images of all 2015 TCs of TS intensity or higher within the Center's area of responsibility. Also included is the necessary viewer software, which features various functions for analyzing satellite imagery (such as image animations) and facilitates efficient post-analysis of TCs and their environments. A setup program and a user manual for the software are included on the DVD. Appendix 8 gives an outline of the DVD and instructions on using the software.

# Chapter 1

## Operations at the RSMC Tokyo - Typhoon Center in 2015

The Center's area of responsibility covers the western North Pacific and the South China Sea (0° – 60°N, 100° – 180°E) including marginal seas and adjacent land areas (Figure 1.1). The Center carries out analysis and forecasting in relation to tropical cyclones (TCs) in the area and also provides the relevant National Meteorological Services (NMSs) with RSMC products via the Global Telecommunication System (GTS), the Aeronautical Fixed Telecommunication Network (AFTN), the Internet and other media.

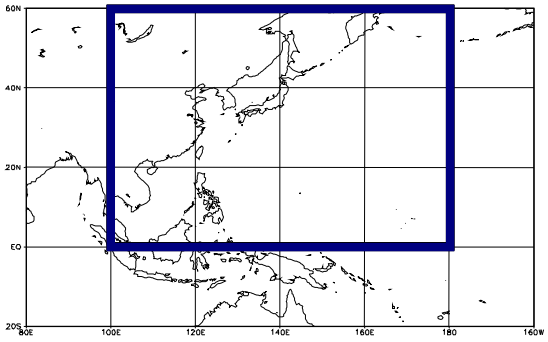


Figure 1.1
Area of responsibility of the RSMC Tokyo - Typhoon Center

### 1.1 Analysis

TC analysis is performed eight times a day at 00, 03, 06, 09, 12, 15, 18 and 21 UTC, and begins with determination of the TC's center position. Cloud images from the Himawari-8 are the principal source for this determination, especially for TCs migrating over data-sparse ocean areas. Information on the TC's direction and speed of movement is extracted primarily from six-hourly displacement vectors of the center position.

The central pressure of TCs is determined mainly from the CI number, which is derived from satellite imagery using the Dvorak method. The CI number also gives the maximum sustained wind speed in the vicinity of the center. The radii of circles representing winds with speeds of more than 30 and 50 knots are determined mainly from surface observation, ASCAT observation and low-level cloud motion winds (LCW) derived from cloud motion vectors of satellite images in the vicinity of the TC.

### 1.2 Forecasts

As a primary basis for TC track forecasts, JMA implements NWP using the Global Spectral Model (GSM) and the Typhoon Ensemble Prediction System (TEPS). The GSM (TL959L100; upgraded on 18 March, 2014) has a horizontal resolution of approximately 20 km and 100 vertical layers, while TEPS (TL479L60; operational as of 11 March 2014) has 25 members with a horizontal resolution of approximately 40 km and 60 vertical layers. Using mainly TEPS, JMA extended its TC track forecast up to five days ahead as of April 2009. Further details and recent model improvements are detailed in Appendix 6. In terms of TC intensity, central pressure and maximum sustained wind speeds are forecasted using the results of NWP models and the Dvorak method.

A probability circle shows the range into which the center of a TC is expected to move with 70% probability at each validation time. The radius of the circle is statistically determined according to the direction and the speed of TC movement based on the results of recent TC track forecast verification.

### 1.3 Provision of RSMC Products

The Center prepares and distributes the RSMC bulletins listed below via the GTS and the AFTN when:

- a TC of tropical storm (TS) intensity or higher exists in the Center's area of responsibility
- a TC is expected to reach or exceed TS intensity in the area within 24 hours

RSMC products are continually issued while any TC of TS intensity or higher exists in the Center's area of responsibility. Appendix 5 denotes the code forms of the bulletins.

(1) RSMC Tropical Cyclone Advisory (WTPQ20-25 RJTD: via GTS)

The RSMC Tropical Cyclone Advisory is issued eight times a day after observations made at 00, 03, 06, 09, 12, 15, 18 and 21 UTC, and reports the following elements in analysis, and in 24-, 48- and 72-hour forecasts for TCs:

| | |
|---|---|
| Analysis | Center position<br>Accuracy of center position determination<br>Direction and speed of movement<br>Central pressure<br>Maximum sustained wind speed (10-minute average)<br>Maximum gust wind speed<br>Radii of wind areas over 50 and 30 knots |
| 24-, 48- and 72-hour forecasts | Center position and radius of probability circle<br>Direction and speed of movement<br>Central pressure<br>Maximum sustained wind speed (10-minute average)<br>Maximum gust wind speed |

(2) RSMC Tropical Cyclone Advisory for Five-day Track Forecast (WTPQ50-55 RJTD: via GTS)

The RSMC Tropical Cyclone Advisory for Five-day Track Forecast is issued four times a day after observations made at 00, 06, 12 and 18UTC, and reports the following elements in analysis and in 24-, 48-, 72-, 96- and 120-hour forecasts for TCs:

| | |
|---|---|
| Analysis | Center position<br>Accuracy of center position determination<br>Direction and speed of movement<br>Central pressure<br>Maximum sustained wind speed (10-minute average)<br>Maximum gust wind speed |

| | |
|---|---|
| | Radii of wind areas over 50 and 30 knots |
| 24-, 48- and 72-hour forecasts | Center position and radius of probability circle<br>Direction and speed of movement<br>Central pressure<br>Maximum sustained wind speed (10-minute average)<br>Maximum gust wind speed |
| 96- and 120-hour forecasts | Center position and radius of probability circle<br>Direction and speed of movement |

(3) RSMC Guidance for Forecast (FXPQ20-25 RJTD: via GTS)

The RSMC Guidance for Forecast reports the results of predictions made by the GSM; which is run four times a day with initial analyses at 00, 06, 12 and 18 UTC. The guidance presents six-hourly GSM predictions for TCs up to 84 hours ahead and TEPS mean six-hourly predictions up to 132 hours ahead, and reports the following elements:

NWP prediction (T = 06 to 84 or 132)
- Center position
- Central pressure*
- Maximum sustained wind speed*

** Predictions of these parameters are given as deviations from those at the initial time.*

(4) SAREP (IUCC10 RJTD: via GTS)

The SAREP in BUFR format reports on the results of TC analysis including intensity information (i.e., the CI number) based on the Dvorak method. It is issued 30 minutes to an hour after observations made at 00, 03, 06, 09, 12, 15, 18 and 21 UTC, and reports the following elements:

| | |
|---|---|
| Himawari-8 imagery analysis | Center position<br>Accuracy of center position determination<br>Direction and speed of movement<br>Mean diameter of overcast cloud<br>Apparent past 24-hour change in intensity**<br>Dvorak Intensity (CI, T, DT, MET, PT number) **<br>Cloud pattern type of the DT number**<br>Trend of past 24-hour change**<br>Cloud pattern type of the PT number**<br>Type of the final T-number** |

*** Reported only at 00, 06, 12 and 18 UTC*

BUFR/CREX templates for translation into table-driven code forms are provided on the WMO website at http://www.wmo.int/pages/prog/www/WMOCodes.html

(5) RSMC Prognostic Reasoning (WTPQ30-35 RJTD: via GTS)

The RSMC Prognostic Reasoning report provides brief reasoning for TC forecasts, and is issued at 00 and 06 UTC following the issuance of the RSMC Tropical Cyclone Advisory. In the bulletin, general comments on the forecasting method, the synoptic situation of the subtropical ridge, the movement and intensity of the TC as well as relevant remarks are given in plain language.

(6) RSMC Tropical Cyclone Best Track (AXPQ20 RJTD: via GTS)

The RSMC Tropical Cyclone Best Track report provides post-analysis data on TCs of TS intensity or higher. It reports the center position, the central pressure and the maximum sustained wind speed. The best track for each TC is usually finalized one and a half months after the termination of related issuance of the above RSMC bulletins.

(7) Tropical Cyclone Advisory for SIGMET (FKPQ30-35 RJTD: via AFTN)

As a Tropical Cyclone Advisory Centre (TCAC) within the framework of the International Civil Aviation Organization (ICAO), the Center provides Tropical Cyclone Advisory (TCA) for SIGMET to Meteorological Watch Offices (MWOs) in order to support their preparations of SIGMET information on TCs. These advisories include the following elements in analysis and in 6-, 12-, 18- and 24-hour forecasts***:

*** *The 6- and 18-hour forecasts were added on 22 May, 2008.*

| | |
|---|---|
| Analysis | Center position |
| | Direction and speed of movement |
| | Central pressure |
| | Maximum sustained wind speed (10-minute average) |
| Forecast | Center position |
| | Maximum sustained wind speed (10-minute average) |

## 1.4 RSMC Data Serving System Upgrade to WMO Information System

As designated at the Sixteenth WMO Congress in June 2011, the Center introduced Data Collection or Production Center (DCPC) service under the Global Information System Center (GISC) Tokyo in August 2011. It provides NWP products such as data on predicted fields in grid-point-value (GPV) form and observational values through WIS Data Discovery, Access and Retrieval (DAR) via a new GISC Tokyo server (http://www.wis-jma.go.jp/). GSM products with resolution of 0.5 and 0.25 degrees (surface layer) and JMA SATAID Service (http://www.wis-jma.go.jp/cms/sataid/) are also available from the server through WIS DAR. All products available via the new server are listed in Appendix 7.

## 1.5 RSMC Tokyo - Typhoon Center Website

The RSMC Tokyo - Typhoon Center Website provides TC advisories on a real-time basis and a wide variety of products including TC analysis archives, technical reviews and annual reports on the Center's activities at http://www.jma.go.jp/jma/jma-eng/jma-center/rsmc-hp-pub-eg/RSMC_HP.htm.

## 1.6 Numerical Typhoon Prediction Website

Since 1 October, 2004, JMA has operated the Numerical Typhoon Prediction (NTP) website (https://tynwp-web.kishou.go.jp/). The site provides TC track predictions from nine major NWP centers (BoM (Australia), CMA (China), CMC (Canada), DWD (Germany), ECMWF, KMA (Republic of Korea), NCEP (USA), UKMO (UK) and JMA) to assist the NMSs of Typhoon Committee Members in improving their TC forecasting and warning services. The site includes:

- Table/chart format TC track predictions from the participating NWP centers with several useful functions such as ensemble mean derivation from any combination of predictions

- Weather charts from NWP models of the participating NWP centers (up to 72 hours ahead)

- Results of JMA's operational TC analysis conducted using satellite images (conventional Dvorak analysis and Early-stage Dvorak analysis)

- Satellite microwave TC snapshot images and warm-core-based TC intensity estimates

- Streamline, vertical wind shear, sea surface temperature and tropical cyclone heat potential

- Storm surge prediction maps, including time-series storm surge prediction charts

## 1.7 Graphical Tropical Cyclone Advisory for SIGMET

In August 2015, the Center started providing graphical Tropical Cyclone Advisory (TCA) in addition to text-format TCA in its role as the ICAO TCAC. Graphical TCA shows not only the text-format TCA information but also the horizontal extent of cumulonimbus cloud and cloud top height associated with TCs potentially affecting aviation safety. It is provided through the website where the specifications and text-format TCA are also available (http://www.data.jma.go.jp/fcd/tca/data/index.html). This website is linked to the NTP website, and graphical TCA is also dispatched to World Area Forecast Centres (WAFCs).

# Chapter 2

## Major Activities of the RSMC Tokyo - Typhoon Center in 2015

### 2.1 Provision of RSMC Products

The Center provides operational products for tropical cyclone (TC) forecasting to NMSs via the GTS, the AFTN and other networks. Monthly and annual totals of products issued in 2015 are listed in Table 2.1.

Table 2.1 Monthly and annual totals of products issued by the RSMC Tokyo - Typhoon Center in 2015

| Product | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **IUCC10** | 39 | 35 | 87 | 50 | 176 | 37 | 382 | 304 | 224 | 246 | 69 | 58 | 1707 |
| **WTPQ20-25** | 43 | 39 | 95 | 52 | 195 | 45 | 401 | 320 | 245 | 267 | 71 | 71 | 1844 |
| **WTPQ30-35** | 10 | 10 | 24 | 13 | 47 | 11 | 100 | 80 | 61 | 65 | 17 | 17 | 455 |
| **WTPQ50-55** | 8 | 10 | 35 | 15 | 63 | 2 | 157 | 109 | 67 | 88 | 29 | 20 | 603 |
| **FXPQ20-25** | 42 | 38 | 94 | 50 | 194 | 44 | 396 | 318 | 240 | 264 | 70 | 70 | 1820 |
| **FKPQ30-35** | 21 | 19 | 47 | 25 | 97 | 22 | 198 | 159 | 120 | 132 | 35 | 35 | 910 |
| **AXPQ20** | 2 | 1 | 1 | 1 | 2 | 2 | 1 | 4 | 2 | 5 | 6 | 0 | 27 |

Notes:

| | |
|---|---|
| IUCC10 RJTD | SAREP (BUFR format) |
| WTPQ20-25 RJTD | RSMC Tropical Cyclone Advisory |
| WTPQ30-35 RJTD | RSMC Prognostic Reasoning |
| WTPQ50-55 RJTD | RSMC Tropical Cyclone Advisory for five-day track forecast |
| FXPQ20-25 RJTD | RSMC Guidance for Forecast |
| FKPQ30-35 RJTD | Tropical Cyclone Advisory for SIGMET |
| AXPQ20 RJTD | RSMC Tropical Cyclone Best Track |

## 2.2 Publications

In March 2015, the 17th issue of the *RSMC Technical Review* was issued with the following areas of focus:

1. Upgrade of JMA's Typhoon Ensemble Prediction System
2. Probability Circles Representing the Uncertainty of Tropical Cyclone Track Forecasts
3. Utilization of Tropical Cyclone Heat Potential for Improving Tropical Cyclone Intensity Forecasts

In December 2015, the Center published the *Annual Report on the Activities of the RSMC Tokyo - Typhoon Center in 2014*. Both publications are available on the website.

## 2.3 Monitoring of Observational Data Availability

The Center carried out regular monitoring of information exchanges for enhanced TC observation in accordance with the standard procedures stipulated in Section 6.2, Chapter 6 of *The Typhoon Committee Operational Manual (TOM) - Meteorological Component (WMO/TD-No. 196)*. Monitoring for the period from 1 November, 2014, to 31 October, 2015, was conducted for two tropical cyclones:

1. TY Goni (1515), from 00UTC 20 August to 00UTC 25 August 2015
2. TY Mujigae (1522), from 12UTC 1 October to 00UTC 5 October 2015

The results were distributed to all Typhoon Committee Members in March 2016, and are also available on the WIS GISC Tokyo server at http://www.wis-jma.go.jp/monitoring/data/monitoring/.

# Chapter 3

## Summary of the 2015 Typhoon Season

In 2015, 27 TCs of tropical storm (TS) intensity or higher formed over the western North Pacific and the South China Sea. This is close to the climatological normal* frequency of 25.6. Among these 27 TCs, 18 reached typhoon (TY) intensity, 4 reached severe tropical storm (STS) intensity and 5 reached TS intensity (Table 3.1).

** Climatological normal is based on data for the period from 1981 to 2010.*

Table 3.1 List of tropical cyclones reaching TS intensity or higher in 2015

| Tropical Cyclone | | | Duration (UTC) (TS or higher) | | | | Minimum Central Pressure (UTC) | lat (N) | long (E) | (hPa) | Max Wind (kt) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| STS | Mekkhala | (1501) | 131200 | Jan | - 181800 | Jan | 161800 | 11.0 | 127.5 | 975 | 60 |
| TY | Higos | (1502) | 071800 | Feb | - 111200 | Feb | 100600 | 14.2 | 154.2 | 940 | 90 |
| TS | Bavi | (1503) | 110600 | Mar | - 171200 | Mar | 131800 | 11.0 | 156.9 | 990 | 45 |
| TY | Maysak | (1504) | 271800 | Mar | - 050600 | Apr | 310600 | 10.0 | 141.3 | 910 | 105 |
| TS | Haishen | (1505) | 040600 | Apr | - 051200 | Apr | 041800 | 9.1 | 151.6 | 998 | 35 |
| TY | Noul | (1506) | 031800 | May | - 120600 | May | 100000 | 17.0 | 123.3 | 920 | 110 |
| TY | Dolphin | (1507) | 091200 | May | - 210000 | May | 160600 | 15.8 | 141.5 | 925 | 100 |
| TS | Kujira | (1508) | 210000 | Jun | - 241800 | Jun | 211200 | 16.8 | 111.6 | 985 | 45 |
| TY | Chan-hom | (1509) | 301200 | Jun | - 130000 | Jul | 091800 | 25.1 | 126.5 | 935 | 90 |
| STS | Linfa | (1510) | 021200 | Jul | - 100000 | Jul | 080000 | 21.5 | 118.7 | 980 | 50 |
| TY | Nangka | (1511) | 031800 | Jul | - 171200 | Jul | 071200 | 14.3 | 153.5 | 925 | 100 |
| TY | Halola | (1512) | 130000 | Jul | - 261200 | Jul | 211800 | 23.0 | 140.5 | 955 | 80 |
| TY | Soudelor | (1513) | 010600 | Aug | - 111200 | Aug | 031800 | 17.9 | 140.7 | 900 | 115 |
| TS | Molave | (1514) | 070600 | Aug | - 140000 | Aug | 101800 | 31.1 | 141.8 | 985 | 45 |
| TY | Goni | (1515) | 141800 | Aug | - 251200 | Aug | 231800 | 25.2 | 124.6 | 930 | 100 |
| TY | Atsani | (1516) | 141800 | Aug | - 250600 | Aug | 190000 | 18.7 | 152.9 | 925 | 100 |
| TY | Kilo | (1517) | 020000 | Sep | - 111200 | Sep | 020000 | 24.0 | 179.8 | 950 | 80 |
| STS | Etau | (1518) | 071200 | Sep | - 090600 | Sep | 080600 | 29.3 | 138.3 | 985 | 50 |
| TS | Vamco | (1519) | 131800 | Sep | - 150000 | Sep | 140000 | 15.0 | 110.3 | 998 | 35 |
| TY | Krovanh | (1520) | 151800 | Sep | - 211200 | Sep | 171200 | 22.2 | 143.5 | 945 | 85 |
| TY | Dujuan | (1521) | 221200 | Sep | - 291200 | Sep | 270000 | 22.3 | 127.5 | 925 | 110 |
| TY | Mujigae | (1522) | 011200 | Oct | - 050000 | Oct | 040000 | 20.5 | 111.5 | 950 | 85 |
| STS | Choi-wan | (1523) | 020600 | Oct | - 071800 | Oct | 070000 | 28.5 | 151.3 | 965 | 60 |
| TY | Koppu | (1524) | 131200 | Oct | - 210600 | Oct | 171800 | 16.1 | 122.1 | 925 | 100 |
| TY | Champi | (1525) | 140000 | Oct | - 251200 | Oct | 181200 | 19.8 | 140.2 | 930 | 95 |
| TY | In-fa | (1526) | 171200 | Nov | - 270000 | Nov | 210000 | 11.2 | 142.9 | 935 | 95 |
| TY | Melor | (1527) | 110600 | Dec | - 170000 | Dec | 140000 | 12.5 | 125.8 | 935 | 95 |

### 3.1 Atmospheric and Oceanographic Conditions in the Tropics

The El Niño event that started in summer 2014 continued to strengthen throughout 2015 and peaked between November and December of the same year. Positive sea surface temperature (SST) anomalies consequently prevailed over the eastern half of the tropics in the western North Pacific all year round. Over the western half, positive SST anomalies were seen in January but zero-to-negative anomalies prevailed for the rest of the year. In the South China Sea, negative SST anomalies were seen early in the year, while positive anomalies prevailed for the rest of the year.

In association with the above, convective activity over the South China Sea and around the Philippines was weaker than the climatological normal all year round except from June to July, whereas convective activity over the eastern part of the western North Pacific was stronger than the climatological normal all year round. Figure 3.1 shows monthly mean streamlines at 850 hPa, areas with lower OLR values (i.e., stronger convective activity) and tracks of TCs that formed in August 2015. It can be seen that four named TCs formed between 140 and 170˚E in line with strong areas of convection and cyclonic flow in the lower troposphere. No named TCs formed over the South China Sea or around the Philippines.

To highlight atmospheric and oceanographic conditions, charts showing monthly mean SST anomalies for the western North Pacific and the South China Sea, monthly mean streamlines at 850 hPa and 200 hPa and OLR for the months from January to December are included on the DVD provided with this report.

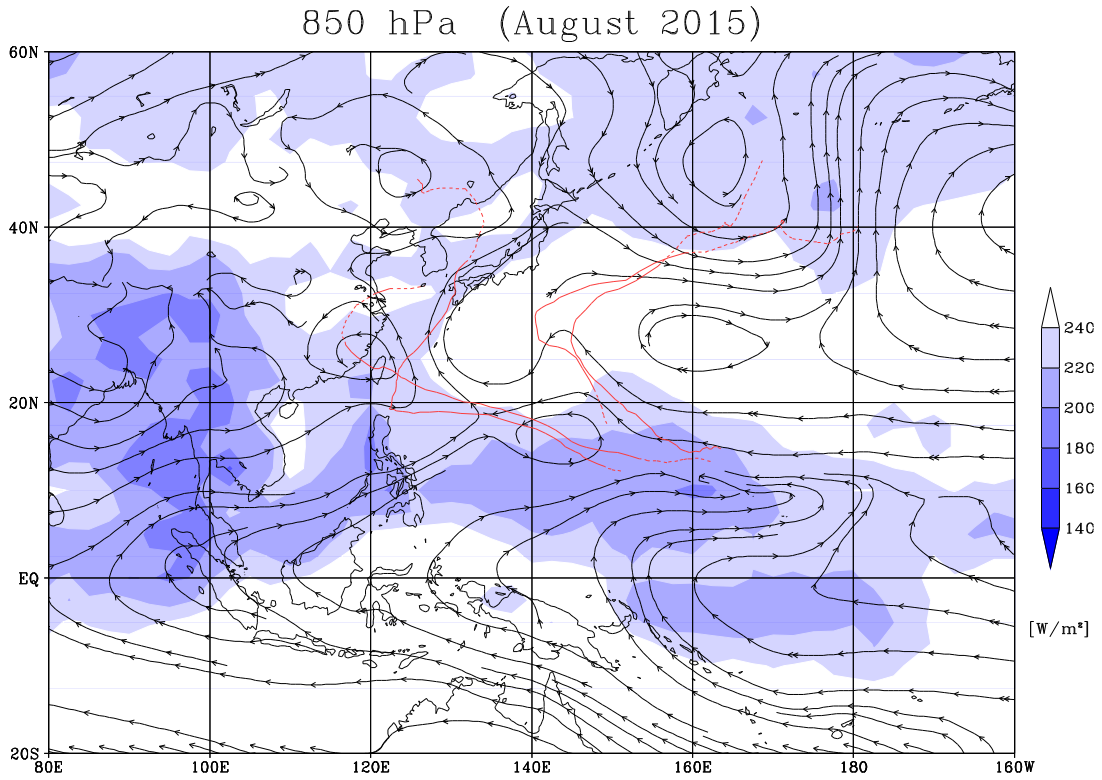


Figure 3.1 Monthly mean streamlines at 850 hPa (lines with arrows) and areas with OLR values of less than 240 W/m$^2$ (shaded) for August 2015. The tracks of the four named TCs that formed in August are superimposed onto the figure.

## 3.2 Tropical Cyclones in 2015

A total of 27 named TCs formed over the western North Pacific and the South China Sea in 2015. Monthly and the climatological normal numbers of TC formations are shown in Figure 3.2, and the tracks of the 27 TCs are shown in Figure 3.3. Figure 3.4 shows the genesis points of the 27 TCs (dots) and related frequency distribution for past years (1951 – 2014).

The mean genesis point of 25 named TCs forming in 2015 (excluding Halola (1512) and Kilo (1517), which formed in the Central Pacific) was at 13.0˚N and 147.2˚E, showing a southeastward deviation from the climatological normal (16.2˚N and 136.7˚E). This was the most easterly point since 1951 corresponding to positive SST anomalies and relatively strong convective activity over the eastern part of the western North Pacific (see Figure 3.1 for the case of August).

The 2015 TC season began with the formation of Mekkhala (1501) in January over the sea east of Yap Island. TCs formed every month from January to March – a period during which the climatological normal number of TC formations is very low. This contributed to TC formations in all months for the first time since records began in 1951. The monthly and annual frequencies of named TCs forming since that year are detailed in Appendix 4.

The mean TC duration** was 7.4 days (the climatological normal: 5.3 days), which was the longest since 1951. Overall, TC genesis points in 2015 were shifted eastward and traveled westward for longer than the climatological normal.

*** TC duration is defined as the period during which a TC remains at TS intensity or higher.*

All seven named TCs making landfall on the continent occurred from June to October. Detailed descriptions of each TC forming in 2015 are included on the DVD provided with this report.

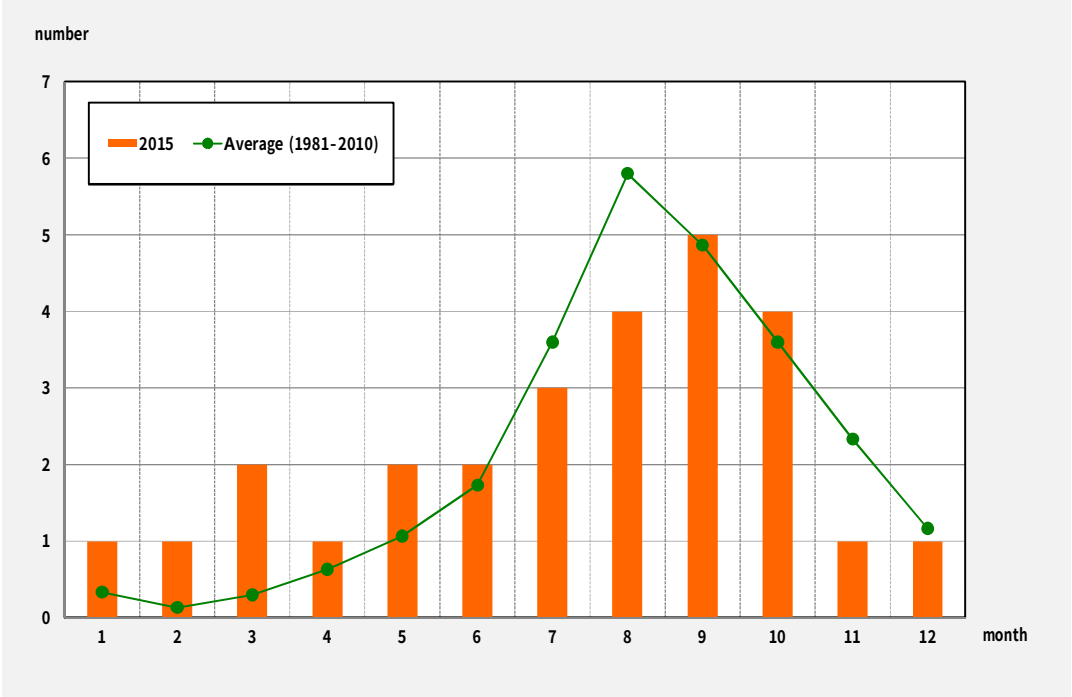


Figure 3.2 Monthly number of TC formations for 2015 compared to the climatological normal

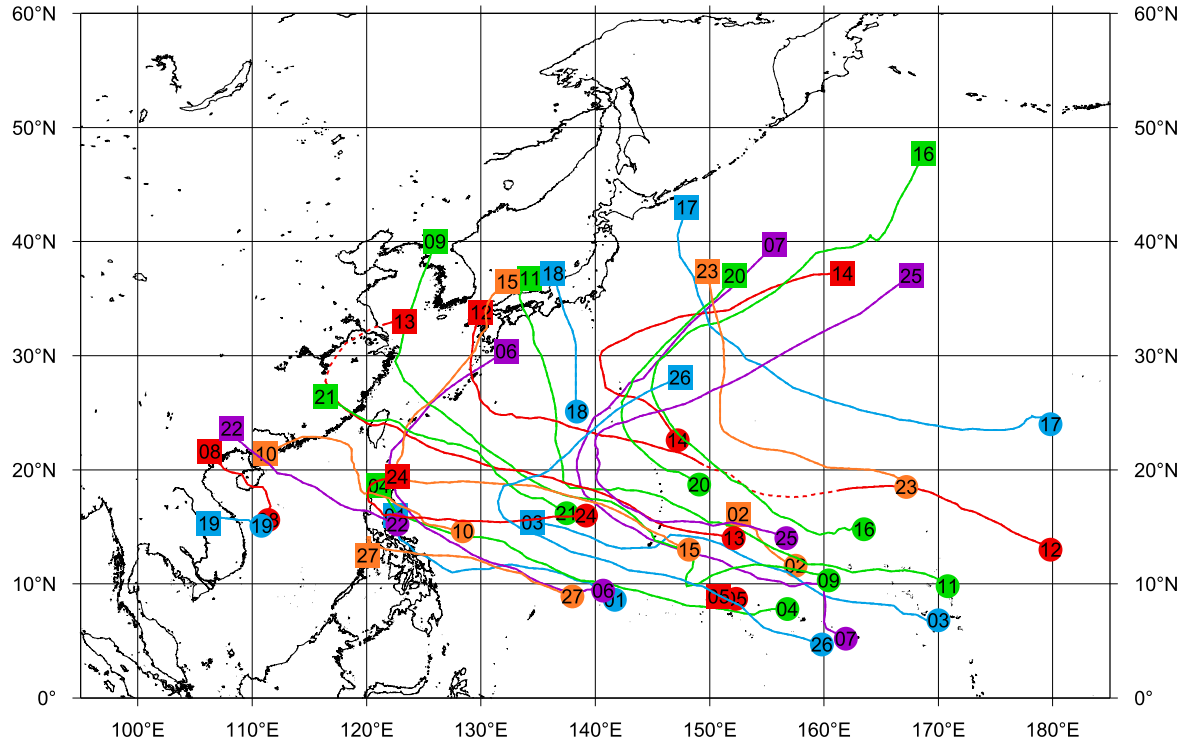


Figure 3.3 Tracks of the 27 named TCs forming in 2015. TC tracks for those with an intensity of TS or higher are shown.

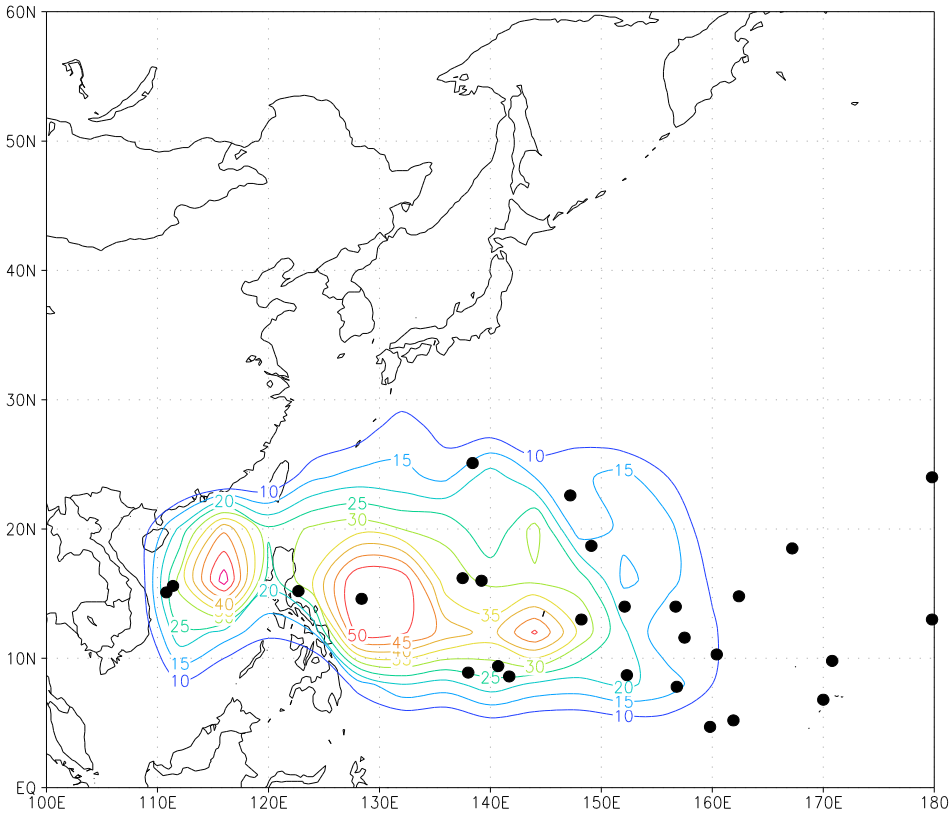


Figure 3.4 Genesis points of the 27 TCs forming in 2015 (dots) and related frequency distribution for 1951 – 2014 (lines)

# Chapter 4
## Verification of Forecasts in 2015

### 4.1 Verification of Operational Forecasts

Operational forecasts for the 27 TCs of TS intensity or higher that formed in 2015 were verified using RSMC TC best track data. The verified elements were forecasts of the center position (up to five days ahead), central pressure and maximum sustained wind (up to three days ahead). The position and intensity errors of operational forecasts for each TC forming in 2015 are indicated in Appendix 3.

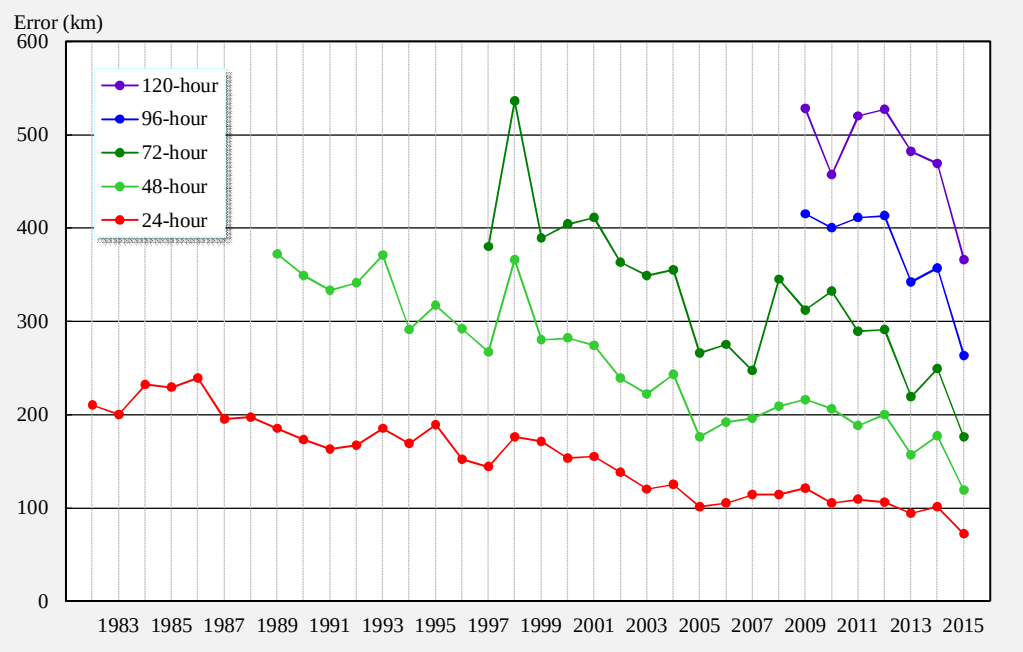


Figure 4.1 Annual mean position errors in 24-, 48-, 72-, 96- and 120-hour operational track forecasts

#### 4.1.1 Center Position

Figure 4.1 shows annual mean errors in TC track forecasts covering periods of 24 hours (since 1982), 48 hours (since 1989), 72 hours (since 1997), 96 hours and 120 hours (since 2009). It shows that operational TC track forecasts have steadily improved since 1982. The errors in 2015 were 72, 119, 176, 263 and 366 km for 24-, 48-, 72-, 96- and 120-hour forecasts, respectively, all of which were the lowest values on record. This is partially attributed to the fact that many of the TCs forming in 2015 were readily forecastable, having formed farther east and moving with constant direction and speed over a longer duration than the climatological normal.

The details of errors for each TC forming in 2015 are summarized in Table 4.1. The forecasts for Linfa (1510), which moved northwestward from the area east of the Philippines and hit Luzon Island and the southern part of China, were characterized by large errors. The 96- and 120-hour forecasts for Haola (1512), which recurved around Japan, also showed large errors, while forecasts for Soudelor (1513) and Koppu (1524) exhibited relatively small errors.

The position errors were also compared with those determined using the persistency (PER) method*. The ratios of EO (i.e., the position errors of operational forecasts) to EP (the position errors of PER method forecasts) as percentages are also shown in Table 4.1. An EO/EP value smaller/greater than 100% indicates that the operational forecast was better/worse than the PER method forecast. The annual mean EO/EP ratios for 24-, 48-, 72-, 96- and 120-hour forecasts in 2015 were 36% (43% in 2014), 27% (34%), 24% (30%), 25% (30%) and 26% (30%), respectively. Figure 4.2 shows a histogram of 24-hour forecast position errors. About 91% (79% in 2014) of 24-hour forecasts, 97% (87%) of 48-hour forecasts, 97% (90%) of 72-hour forecasts, 93% (82%) of 96-hour forecasts and 83% (74%) of 120-hour forecasts had errors of less than 150, 300, 450, 500 and 600 km, respectively.

** The PER method is based on the assumption that a TC holds the same movement throughout the forecast period, and linear extrapolation for the latest 12-hour track of the TC is applied to create TC track forecasts. Position errors with the PER method are used to evaluate the relative performance of operational forecasts and model predictions.*

Table 4.1 Mean position errors of 24-, 48-, 72-, 96- and 120-hour operational forecasts for each TC forming in 2015. S.D., EO, EP, and EO/EP represent the standard deviation of operational forecast position error, the operational forecast position error, the position error with the PER method and the ratio of EO to EP, respectively.

| Tropical Cyclone | | | 24-hour Forecast | | | | 48-hour Forecast | | | | 72-hour Forecast | | | | 96-hour Forecast | | | | 120-hour Forecast | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Mean (km) | S.D. (km) | Num. | EO/EP (%) | Mean (km) | S.D. (km) | Num. | EO/EP (%) | Mean (km) | S.D. (km) | Num | EO/EP (%) | Mean (km) | S.D. (km) | Num | EO/EP (%) | Mean (km) | S.D. (km) | Num | EO/EP (%) |
| STS | Mekkhala | (1501) | 52 | 39 | 17 | 23 | 114 | 63 | 12 | 22 | 145 | 57 | 6 | 24 | 262 | 59 | 2 | 34 | - | - | 0 | - |
| TY | Higos | (1502) | 65 | 23 | 11 | 46 | 80 | 16 | 7 | 25 | 149 | 34 | 3 | 48 | - | - | 0 | - | - | - | 0 | - |
| TS | Bavi | (1503) | 123 | 52 | 21 | 35 | 128 | 52 | 16 | 25 | 152 | 68 | 11 | 19 | 157 | 75 | 7 | 19 | 77 | 43 | 3 | 8 |
| TY | Maysak | (1504) | 57 | 33 | 30 | 44 | 78 | 37 | 26 | 31 | 130 | 55 | 22 | 33 | 188 | 50 | 18 | 33 | 239 | 65 | 14 | 34 |
| TS | Haishen | (1505) | 118 | 0 | 1 | - | - | - | 0 | - | - | - | 0 | - | - | - | 0 | - | - | - | 0 | - |
| TY | Noul | (1506) | 54 | 32 | 30 | 31 | 119 | 81 | 26 | 30 | 146 | 70 | 22 | 21 | 204 | 98 | 18 | 20 | 213 | 194 | 14 | 16 |
| TY | Dolphin | (1507) | 69 | 53 | 42 | 28 | 130 | 103 | 38 | 23 | 203 | 144 | 34 | 21 | 262 | 157 | 30 | 18 | 322 | 190 | 26 | 18 |
| TS | Kujira | (1508) | 123 | 60 | 11 | 65 | 227 | 45 | 7 | 53 | 322 | 19 | 3 | 69 | - | - | 0 | - | - | - | 0 | - |
| TY | Chan-hom | (1509) | 86 | 53 | 46 | 34 | 146 | 119 | 42 | 26 | 210 | 131 | 38 | 29 | 335 | 194 | 34 | 34 | 474 | 273 | 30 | 36 |
| STS | Linfa | (1510) | 107 | 59 | 26 | 47 | 187 | 47 | 22 | 52 | 312 | 106 | 18 | 46 | 428 | 154 | 14 | 47 | 527 | 228 | 10 | 50 |
| TY | Nangka | (1511) | 58 | 25 | 51 | 41 | 112 | 49 | 47 | 35 | 164 | 76 | 43 | 29 | 263 | 131 | 39 | 30 | 396 | 175 | 35 | 34 |
| TY | Halola | (1512) | 72 | 40 | 35 | 49 | 124 | 75 | 26 | 42 | 192 | 64 | 19 | 46 | 358 | 190 | 15 | 58 | 517 | 318 | 15 | 68 |
| TY | Soudelor | (1513) | 58 | 28 | 29 | 58 | 79 | 38 | 25 | 44 | 102 | 40 | 21 | 40 | 135 | 66 | 17 | 41 | 196 | 92 | 13 | 42 |
| TS | Molave | (1514) | 60 | 37 | 23 | 23 | 62 | 30 | 18 | 10 | 78 | 48 | 14 | 6 | 231 | 133 | 10 | 11 | 600 | 66 | 6 | 19 |
| TY | Goni | (1515) | 48 | 33 | 39 | 22 | 84 | 48 | 35 | 15 | 114 | 89 | 31 | 11 | 177 | 129 | 27 | 11 | 265 | 161 | 23 | 13 |
| TY | Atsani | (1516) | 59 | 29 | 38 | 37 | 98 | 49 | 34 | 23 | 162 | 58 | 30 | 22 | 263 | 91 | 26 | 24 | 388 | 190 | 22 | 27 |
| TY | Kilo | (1517) | 57 | 17 | 34 | 41 | 104 | 45 | 30 | 30 | 170 | 61 | 26 | 26 | 256 | 113 | 22 | 25 | 366 | 148 | 18 | 24 |
| STS | Etau | (1518) | 117 | 38 | 3 | 47 | - | - | 0 | - | - | - | 0 | - | - | - | 0 | - | - | - | 0 | - |
| TS | Vamco | (1519) | 82 | 0 | 1 | - | - | - | 0 | - | - | - | 0 | - | - | - | 0 | - | - | - | 0 | - |
| TY | Krovanh | (1520) | 64 | 46 | 17 | 33 | 117 | 82 | 13 | 20 | 177 | 80 | 9 | 15 | 270 | 43 | 5 | 14 | 356 | 0 | 1 | - |
| TY | Dujuan | (1521) | 69 | 70 | 24 | 24 | 89 | 62 | 20 | 14 | 147 | 55 | 15 | 15 | 342 | 126 | 11 | 23 | 643 | 272 | 7 | 28 |
| TY | Mujigae | (1522) | 52 | 26 | 10 | 31 | 154 | 51 | 6 | 51 | 276 | 0 | 1 | - | - | - | 0 | - | - | - | 0 | - |
| STS | Choi-wan | (1523) | 93 | 65 | 18 | 20 | 76 | 23 | 14 | 9 | 139 | 74 | 10 | 12 | 250 | 117 | 6 | 20 | 505 | 8 | 2 | - |
| TY | Koppu | (1524) | 81 | 42 | 27 | 44 | 104 | 53 | 23 | 30 | 117 | 41 | 19 | 18 | 141 | 29 | 15 | 15 | 152 | 44 | 11 | 9 |
| TY | Champi | (1525) | 83 | 57 | 42 | 44 | 138 | 64 | 38 | 32 | 211 | 64 | 34 | 28 | 335 | 118 | 30 | 29 | 442 | 194 | 26 | 28 |
| TY | In-fa | (1526) | 101 | 44 | 31 | 47 | 219 | 88 | 27 | 38 | 319 | 150 | 23 | 33 | 321 | 190 | 19 | 25 | 316 | 231 | 15 | 23 |
| TY | Melor | (1527) | 75 | 47 | 19 | 54 | 120 | 61 | 15 | 37 | 191 | 83 | 11 | 41 | 230 | 98 | 7 | 31 | 185 | 72 | 3 | 8 |
| Annual Mean (Total) | | | 72 | 48 | 676 | 36 | 119 | 77 | 567 | 27 | 176 | 105 | 463 | 24 | 263 | 150 | 372 | 25 | 366 | 228 | 294 | 26 |

Table 4.2 presents the mean hitting ratios and radii of 70% probability circles** provided in operational forecasts for each TC forming in 2015. The term *hitting ratio* here is used to describe the ratio of the number of 70% probability circles within which the actual TC center fell to the total number of circles. The annual mean radius of circles provided in 24-hour position forecasts was 140 km (145 km in 2014), and their hitting ratio was 89% (78%). The corresponding values for 48-hour forecasts were 242 km (251 km in 2014) and 93% (78%), those for 72-hour forecasts were 355 km (360 km in 2014) and 94% (76%), those for 96-hour forecasts were 450 km (480 km in 2014) and 88% (79%), and those for 120-hour forecasts were 573 km (602 km in 2014) and 83% (70%).

*** Probability circle: a circular range in which a TC is expected to be located with a probability of 70% at each forecast time*

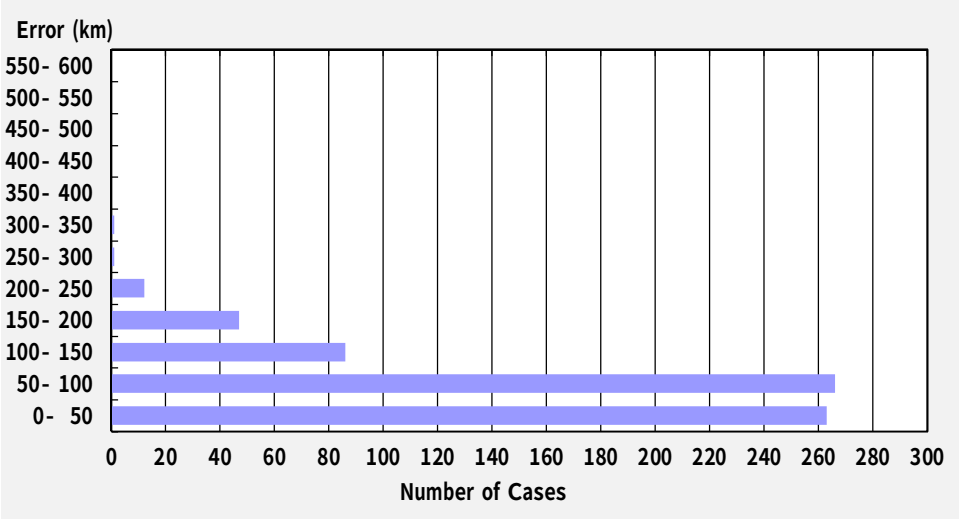


Figure 4.2 Histogram of 24-hour forecast position errors in 2015
(Histograms for 48-, 72-, 96- and 120-hour forecasts are included on the DVD provided with this report).

Table 4.2 Mean hitting ratios (%) and radii (km) of 70% probability circles provided in 24-, 48-, 72-, 96- and 120-hour operational forecasts for each TC forming in 2015

| Tropical Cyclone | | | 24-hour Forecast | | | 48-hour Forecast | | | 72-hour Forecast | | | 96-hour Forecast | | | 120-hour Forecast | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Ratio (%) | Num. | Radius (km) | Ratio (%) | Num. | Radius (km) | Ratio (%) | Num. | Radius (km) | Ratio (%) | Num. | Radius (km) | Ratio (%) | Num. | Radius (km) |
| STS | Mekkhala | (1501) | 100 | 17 | 148 | 92 | 12 | 231 | 100 | 6 | 296 | 100 | 2 | 407 | - | 0 | - |
| TY | Higos | (1502) | 100 | 11 | 130 | 100 | 7 | 204 | 100 | 3 | 296 | - | 0 | - | - | 0 | - |
| TS | Bavi | (1503) | 62 | 21 | 147 | 100 | 16 | 266 | 100 | 11 | 389 | 100 | 7 | 519 | 100 | 3 | 695 |
| TY | Maysak | (1504) | 100 | 30 | 135 | 100 | 26 | 236 | 100 | 22 | 347 | 100 | 18 | 444 | 100 | 14 | 556 |
| TS | Haishen | (1505) | 100 | 1 | 130 | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| TY | Noul | (1506) | 97 | 30 | 138 | 96 | 26 | 223 | 100 | 22 | 347 | 94 | 18 | 399 | 93 | 14 | 513 |
| TY | Dolphin | (1507) | 81 | 42 | 145 | 79 | 38 | 256 | 88 | 34 | 380 | 87 | 30 | 457 | 85 | 26 | 577 |
| TS | Kujira | (1508) | 55 | 11 | 132 | 57 | 7 | 204 | 0 | 3 | 296 | - | 0 | - | - | 0 | - |
| TY | Chan-hom | (1509) | 78 | 46 | 137 | 81 | 42 | 231 | 82 | 38 | 344 | 85 | 34 | 455 | 77 | 30 | 574 |
| STS | Linfa | (1510) | 73 | 26 | 138 | 73 | 22 | 231 | 72 | 18 | 354 | 64 | 14 | 444 | 70 | 10 | 556 |
| TY | Nangka | (1511) | 100 | 51 | 138 | 98 | 47 | 227 | 98 | 43 | 336 | 82 | 39 | 454 | 80 | 35 | 578 |
| TY | Halola | (1512) | 91 | 35 | 138 | 96 | 26 | 238 | 100 | 19 | 321 | 73 | 15 | 484 | 67 | 15 | 648 |
| TY | Soudelor | (1513) | 100 | 29 | 137 | 100 | 25 | 228 | 100 | 21 | 340 | 100 | 17 | 444 | 100 | 13 | 556 |
| TS | Molave | (1514) | 96 | 23 | 153 | 100 | 18 | 295 | 100 | 14 | 431 | 100 | 10 | 519 | 83 | 6 | 695 |
| TY | Goni | (1515) | 97 | 39 | 142 | 97 | 35 | 257 | 97 | 31 | 373 | 96 | 27 | 447 | 100 | 23 | 555 |
| TY | Atsani | (1516) | 100 | 38 | 138 | 100 | 34 | 232 | 100 | 30 | 327 | 92 | 26 | 427 | 73 | 22 | 535 |
| TY | Kilo | (1517) | 100 | 34 | 140 | 100 | 30 | 252 | 100 | 26 | 378 | 95 | 22 | 444 | 89 | 18 | 556 |
| STS | Etau | (1518) | 67 | 3 | 145 | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| TS | Vamco | (1519) | 100 | 1 | 130 | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| TY | Krovanh | (1520) | 94 | 17 | 144 | 100 | 13 | 279 | 100 | 9 | 401 | 100 | 5 | 519 | 100 | 1 | 695 |
| TY | Dujuan | (1521) | 83 | 24 | 135 | 100 | 20 | 218 | 100 | 15 | 309 | 82 | 11 | 444 | 43 | 7 | 595 |
| TY | Mujigae | (1522) | 100 | 10 | 141 | 100 | 6 | 232 | 100 | 1 | 296 | - | 0 | - | - | 0 | - |
| STS | Choi-wan | (1523) | 83 | 18 | 135 | 100 | 14 | 254 | 100 | 10 | 359 | 100 | 6 | 494 | 100 | 2 | 695 |
| TY | Koppu | (1524) | 85 | 27 | 139 | 100 | 23 | 237 | 100 | 19 | 326 | 100 | 15 | 415 | 100 | 11 | 535 |
| TY | Champi | (1525) | 83 | 42 | 147 | 95 | 38 | 278 | 100 | 34 | 398 | 77 | 30 | 462 | 73 | 26 | 614 |
| TY | In-fa | (1526) | 84 | 31 | 141 | 63 | 27 | 248 | 70 | 23 | 375 | 79 | 19 | 448 | 80 | 15 | 556 |
| TY | Melor | (1527) | 84 | 19 | 134 | 100 | 15 | 210 | 82 | 11 | 306 | 100 | 7 | 370 | 100 | 3 | 482 |
| Annual Mean (Total) | | | 89 | 676 | 140 | 93 | 567 | 242 | 94 | 463 | 355 | 88 | 372 | 450 | 83 | 294 | 573 |

### 4.1.2 Central Pressure and Maximum Wind Speed

Table 4.3 gives the root mean square errors (RMSEs) of 24-, 48- and 72-hour operational central pressure forecasts for each TC forming in 2015. RMSE data for maximum wind speed forecasts are included on the DVD provided with this report. The annual mean RMSEs of central pressure and maximum wind speed for 24-hour forecasts were 13.7 hPa (14.4 hPa in 2014) and 5.9 m/s (6.1 m/s). For 48-hour forecasts, the corresponding values were 19.1 hPa (21.0 hPa in 2014) and 8.2 m/s (8.9 m/s), while those for 72-hour forecasts were 21.2 hPa (23.8 hPa in 2014) and 9.0 m/s (10.4 m/s).

Table 4.3 Mean intensity errors of 24-, 48- and 72-hour operational central pressure forecasts for each TC forming in 2015

| Tropical Cyclone | | | 24-hour Forecast | | | 48-hour Forecast | | | 72-hour Forecast | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Error (hPa) | RMSE (hPa) | Num. | Error (hPa) | RMSE (hPa) | Num. | Error (hPa) | RMSE (hPa) | Num. |
| STS | Mekkhala | (1501) | 1.8 | 9.5 | 17 | 3.4 | 8.3 | 12 | -3.8 | 7.6 | 6 |
| TY | Higos | (1502) | -0.7 | 21.5 | 11 | 13.7 | 19.8 | 7 | -4.7 | 11.5 | 3 |
| TS | Bavi | (1503) | -2.0 | 3.4 | 21 | -2.9 | 3.7 | 16 | -3.6 | 4.0 | 11 |
| TY | Maysak | (1504) | 6.7 | 13.9 | 30 | 11.2 | 19.4 | 26 | 14.0 | 23.9 | 22 |
| TS | Haishen | (1505) | -8.0 | 8.0 | 1 | - | - | 0 | - | - | 0 |
| TY | Noul | (1506) | -3.3 | 14.3 | 30 | 3.1 | 15.8 | 26 | 3.2 | 20.2 | 22 |
| TY | Dolphin | (1507) | -4.7 | 14.0 | 42 | -6.5 | 16.1 | 38 | -6.0 | 17.8 | 34 |
| TS | Kujira | (1508) | 1.0 | 4.4 | 11 | 7.0 | 8.1 | 7 | 9.0 | 9.5 | 3 |
| TY | Chan-hom | (1509) | -6.9 | 14.6 | 46 | -11.4 | 20.6 | 42 | -15.3 | 21.8 | 38 |
| STS | Linfa | (1510) | -5.3 | 8.2 | 26 | -5.2 | 11.9 | 22 | -8.7 | 13.2 | 18 |
| TY | Nangka | (1511) | -5.2 | 12.9 | 51 | -8.6 | 21.1 | 47 | -9.4 | 25.6 | 43 |
| TY | Halola | (1512) | -5.8 | 16.0 | 35 | -6.2 | 18.3 | 26 | -4.7 | 16.8 | 19 |
| TY | Soudelor | (1513) | 2.2 | 19.3 | 29 | 1.6 | 29.7 | 25 | -5.3 | 24.8 | 21 |
| TS | Molave | (1514) | -2.2 | 4.5 | 23 | -7.1 | 8.2 | 18 | -8.8 | 11.6 | 14 |
| TY | Goni | (1515) | -5.6 | 18.6 | 39 | -7.4 | 21.8 | 35 | -9.8 | 20.9 | 31 |
| TY | Atsani | (1516) | -4.3 | 12.0 | 38 | -7.1 | 16.6 | 34 | -11.2 | 20.4 | 30 |
| TY | Kilo | (1517) | -10.4 | 17.3 | 34 | -22.3 | 26.5 | 30 | -31.2 | 32.4 | 26 |
| STS | Etau | (1518) | 0.0 | 4.1 | 3 | - | - | 0 | - | - | 0 |
| TS | Vamco | (1519) | -4.0 | 4.0 | 1 | - | - | 0 | - | - | 0 |
| TY | Krovanh | (1520) | -3.1 | 16.2 | 17 | -7.2 | 27.3 | 13 | -11.0 | 21.8 | 9 |
| TY | Dujuan | (1521) | 4.7 | 11.3 | 24 | 11.1 | 20.8 | 20 | 17.1 | 29.1 | 15 |
| TY | Mujigae | (1522) | 6.0 | 9.2 | 10 | 14.8 | 20.9 | 6 | -5.0 | 5.0 | 1 |
| STS | Choi-wan | (1523) | -8.6 | 10.1 | 18 | -10.0 | 12.1 | 14 | -10.5 | 12.3 | 10 |
| TY | Koppu | (1524) | -2.0 | 10.5 | 27 | 4.3 | 11.5 | 23 | 3.9 | 12.4 | 19 |
| TY | Champi | (1525) | -3.5 | 11.6 | 42 | -3.7 | 16.4 | 38 | 2.4 | 17.6 | 34 |
| TY | In-fa | (1526) | -3.5 | 14.9 | 31 | -5.6 | 19.4 | 27 | -8.3 | 23.0 | 23 |
| TY | Melor | (1527) | 5.8 | 15.8 | 19 | 15.3 | 25.1 | 15 | 12.2 | 25.3 | 11 |
| Annual Mean (Total) | | | -2.9 | 13.7 | 676 | -3.6 | 19.1 | 567 | -5.7 | 21.2 | 463 |

Figure 4.3 shows a histogram of maximum wind speed errors for 24-hour forecasts. Approximately 47% (54% in 2014) of 24-hour forecasts had errors of less than ±3.75 m/s, with figures of ±6.25 m/s for 56% (62%) of 48-hour forecasts and ±6.25 m/s for 47% (50%) of 72-hour forecasts.

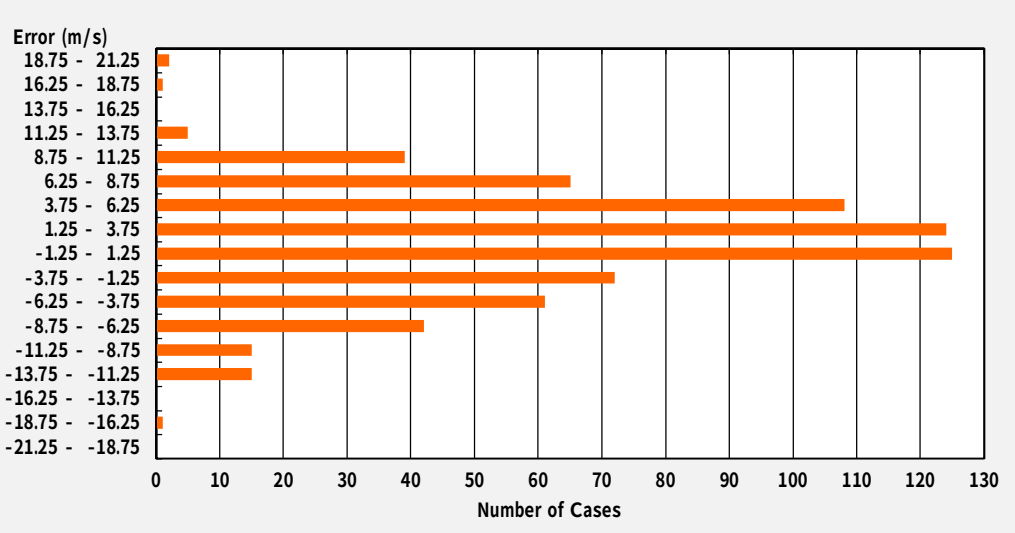


Figure 4.3 Histogram of 24-hour forecast maximum wind speed errors in 2015 (Histograms for 48-, 72-, 96- and 120-hour forecasts are included on the DVD provided with this report).

## 4.2 Verification of Numerical Models (GSM, TEPS)

The Global Spectral Model (GSM) and the Typhoon Ensemble Prediction System (TEPS) provide primary information for use by JMA forecasters in making operational TC track and intensity forecasts. The details of GSM and TEPS and information on recent related improvements are given in Appendix 6. GSM and TEPS predictions were verified with RSMC TC best track data and predictions using the persistency (PER) method. All TC forecast verifications were conducted for both systems.

### 4.2.1 GSM Prediction

#### 1) Center Position

GSM annual mean position errors observed since 1997 are presented in Figure 4.4. In 2015, the annual mean errors for 30-, 54- and 78-hour* predictions were 109 km (124 km in 2014), 173 km (212 km) and 256 km (312 km), respectively. The mean position errors of 18-, 30-, 42-, 54-, 66- and 78-hour predictions for each TC are given in Table 4.4.

** 30-, 54- and 78-hour GSM predictions are used as primary information by forecasters creating 24-, 48- and 72-hour operational forecasts, respectively.*

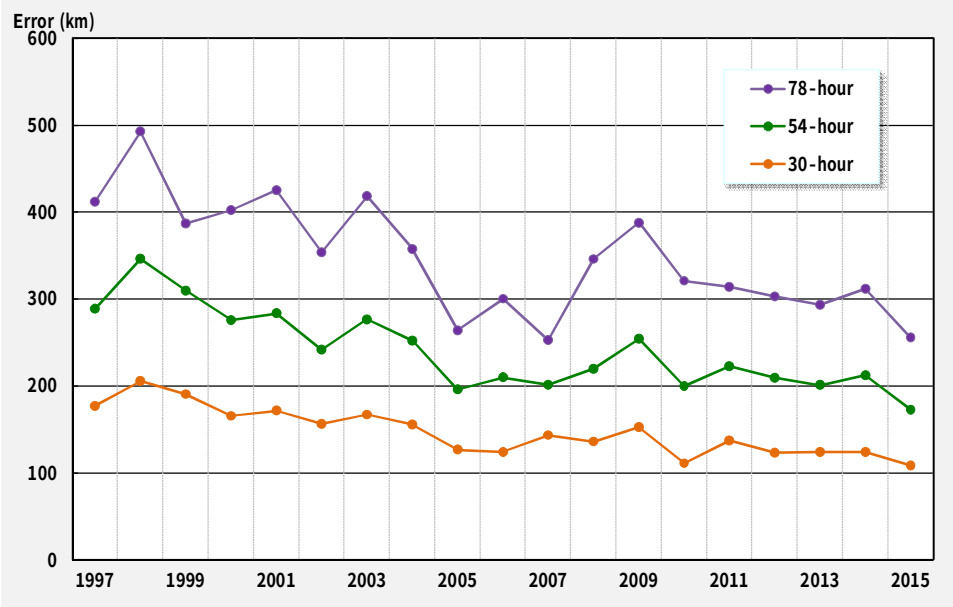


Figure 4.4 GSM annual mean position errors since 1997

Table 4.4 GSM mean position errors (km) for each TC forming in 2015. The number of samples is given in parentheses.

| Tropical Cyclone | | | T=18 | | T=30 | | T=42 | | T=54 | | T=66 | | T=78 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| STS | MEKKHALA | (1501) | 57.1 | (18) | 72.6 | (16) | 92.7 | (14) | 111.0 | (12) | 115.5 | (10) | 106.8 | (8) |
| TY | HIGOS | (1502) | 83.1 | (16) | 119.3 | (14) | 142.4 | (12) | 213.7 | (10) | 321.6 | (8) | 428.6 | (6) |
| TS | BAVI | (1503) | 121.3 | (24) | 126.4 | (22) | 150.4 | (20) | 206.3 | (18) | 256.0 | (16) | 271.1 | (14) |
| TY | MAYSAK | (1504) | 62.8 | (34) | 85.2 | (32) | 120.9 | (30) | 160.5 | (28) | 208.6 | (26) | 263.0 | (23) |
| TS | HAISHEN | (1505) | 58.0 | (5) | 60.2 | (3) | 95.2 | (1) | - | (-) | - | (-) | - | (-) |
| TY | NOUL | (1506) | 71.2 | (37) | 101.4 | (35) | 132.6 | (33) | 158.3 | (31) | 199.8 | (29) | 217.3 | (27) |
| TY | DOLPHIN | (1507) | 71.0 | (54) | 100.9 | (52) | 145.9 | (50) | 200.2 | (48) | 265.6 | (46) | 316.2 | (44) |
| TS | KUJIRA | (1508) | 88.4 | (15) | 104.7 | (13) | 153.4 | (11) | 227.7 | (8) | 310.3 | (5) | 415.6 | (2) |
| TY | CHAN-HOM | (1509) | 77.4 | (49) | 99.0 | (46) | 100.2 | (42) | 127.6 | (40) | 166.9 | (38) | 202.5 | (36) |
| STS | LINFA | (1510) | 95.9 | (30) | 123.5 | (28) | 146.1 | (26) | 172.1 | (24) | 236.5 | (22) | 304.2 | (20) |
| TY | NANGKA | (1511) | 64.9 | (56) | 86.6 | (54) | 113.4 | (52) | 136.9 | (50) | 165.4 | (48) | 188.5 | (46) |
| TY | HALOLA | (1512) | 75.5 | (47) | 97.7 | (45) | 119.0 | (43) | 141.7 | (41) | 165.6 | (39) | 180.6 | (37) |
| TY | SOUDELOR | (1513) | 73.3 | (39) | 111.7 | (37) | 159.6 | (35) | 200.8 | (33) | 245.6 | (31) | 282.2 | (29) |
| TS | MOLAVE | (1514) | 93.8 | (28) | 118.1 | (26) | 115.6 | (24) | 109.3 | (22) | 111.2 | (20) | 121.5 | (18) |
| TY | GONI | (1515) | 82.5 | (46) | 124.0 | (44) | 142.0 | (41) | 170.5 | (39) | 205.8 | (37) | 239.2 | (35) |
| TY | ATSANI | (1516) | 83.9 | (42) | 113.9 | (40) | 153.7 | (38) | 178.3 | (36) | 222.5 | (34) | 276.3 | (32) |
| TY | KILO | (1517) | 57.4 | (36) | 73.5 | (34) | 97.5 | (32) | 134.0 | (30) | 184.3 | (28) | 225.5 | (26) |
| STS | ETAU | (1518) | 142.3 | (10) | 222.5 | (8) | 303.0 | (6) | 426.4 | (4) | 678.4 | (2) | - | (-) |
| TS | VAMCO | (1519) | 42.1 | (4) | 82.0 | (2) | - | (-) | - | (-) | - | (-) | - | (-) |
| TY | KROVANH | (1520) | 81.8 | (24) | 126.3 | (22) | 181.1 | (20) | 248.1 | (18) | 339.2 | (16) | 460.8 | (14) |
| TY | DUJUAN | (1521) | 96.4 | (29) | 89.2 | (27) | 98.2 | (25) | 123.7 | (23) | 170.2 | (21) | 221.4 | (19) |
| TY | MUJIGAE | (1522) | 62.0 | (12) | 68.2 | (9) | 91.0 | (7) | 115.3 | (5) | 165.9 | (3) | 334.2 | (1) |
| STS | CHOI-WAN | (1523) | 101.9 | (24) | 103.5 | (22) | 108.3 | (20) | 140.5 | (18) | 182.3 | (16) | 238.7 | (14) |
| TY | KOPPU | (1524) | 93.4 | (31) | 118.8 | (29) | 153.2 | (27) | 180.6 | (25) | 197.5 | (23) | 233.2 | (21) |
| TY | CHAMPI | (1525) | 89.3 | (47) | 127.4 | (45) | 168.6 | (43) | 223.3 | (41) | 278.6 | (39) | 353.4 | (37) |
| TY | IN-FA | (1526) | 108.6 | (33) | 174.2 | (31) | 235.8 | (29) | 296.2 | (27) | 345.5 | (25) | 382.5 | (23) |
| TY | MELOR | (1527) | 76.9 | (23) | 100.6 | (21) | 114.6 | (19) | 118.8 | (17) | 142.8 | (15) | 162.0 | (13) |
| Annual Mean (Total) | | | 81.4 | (813) | 108.6 | (757) | 137.7 | (700) | 172.6 | (648) | 215.9 | (597) | 255.5 | (545) |

Table 4.5 shows relative GSM performance compared with results obtained using the PER method. In this comparison, TCs were classified into the three life stages of before, during and after recurvature. The definition of the stages is based on the direction of movement of each TC at individual prediction times. The table indicates that GSM results outperformed those of the PER method throughout the forecast period beyond 18 hours from the initial time, and that the ratios of error reduction for the GSM compared to the PER method were about 44% (47% in 2014), 56% (56%), 65% (61%) and 67% (64%) for 18-, 30-, 54- and 78-hour predictions, respectively.

About 78% (73% in 2014) of 30-hour predictions had errors of less than 150 km, while 89% (77%) of 54-hour predictions had errors of less than 300 km, and 89% (77%) of 78-hour predictions had errors of less than 450 km. Histograms showing the position errors of 30-, 54- and 78-hour predictions are included on the DVD provided with this report.

Table 4.5 Mean position errors (km) of GSM and PER method predictions for the 27 TCs forming in 2015 in the stages before, during and after recurvature. The number of samples is given in parentheses. IMPROV is the ratio of error reductions in GSM results to those observed using the PER method.

| TIME | MODEL | Before | During | After | All |
|---|---|---|---|---|---|
| T=18 | GSM | 83.2 (552) | 78.1 (145) | 77.0 (116) | 81.4 (813) |
| | PER | 132.5 (552) | 156.7 (145) | 185.2 (116) | 144.4 (813) |
| | IMPROV | 37.2 % | 50.2 % | 58.4 % | 43.6 % |
| T=30 | GSM | 111.5 (511) | 90.3 (132) | 116.7 (114) | 108.6 (757) |
| | PER | 222.7 (511) | 265.4 (132) | 329.2 (114) | 246.2 (757) |
| | IMPROV | 49.9 % | 66.0 % | 64.5 % | 55.9 % |
| T=42 | GSM | 139.1 (464) | 114.6 (125) | 157.9 (111) | 137.7 (700) |
| | PER | 319.3 (464) | 393.2 (125) | 497.7 (111) | 360.8 (700) |
| | IMPROV | 56.4 % | 70.9 % | 68.3 % | 61.8 % |
| T=54 | GSM | 170.7 (419) | 157.9 (120) | 195.8 (109) | 172.6 (648) |
| | PER | 423.9 (419) | 509.0 (120) | 703.6 (109) | 486.7 (648) |
| | IMPROV | 59.7 % | 69.0 % | 72.2 % | 64.5 % |
| T=66 | GSM | 208.4 (376) | 215.7 (114) | 242.7 (107) | 215.9 (597) |
| | PER | 531.1 (376) | 633.0 (114) | 945.6 (107) | 624.9 (597) |
| | IMPROV | 60.8 % | 65.9 % | 74.3 % | 65.4 % |
| T=78 | GSM | 244.9 (333) | 257.7 (106) | 286.6 (106) | 255.5 (545) |
| | PER | 649.0 (333) | 765.2 (106) | 1121.7 (106) | 763.6 (545) |
| | IMPROV | 62.3 % | 66.3 % | 74.4 % | 66.5 % |

### 2) Central Pressure and Maximum Wind Speed

The mean errors of 30-, 54- and 78-hour GSM central pressure predictions in 2015 were +13.7 hPa (+13.1 hPa in 2014), +14.0 hPa (+13.1 hPa) and +14.0 hPa (+12.6 hPa), respectively. Their root mean square errors (RMSEs) were 24.0 hPa (23.9 hPa in 2014) for 30-hour predictions, 26.2 hPa (25.7 hPa) for 54-hour predictions and 28.3 hPa (26.5 hPa) for 78-hour predictions. The biases for 30-, 54- and 78-hour maximum wind speed predictions were -8.1 m/s (-8.0 m/s in 2014) with a RMSE of 11.7 m/s (12.2 m/s), -7.8 m/s (-7.8 m/s) with a RMSE of 12.9 m/s (13.2 m/s) and -7.5 m/s (-7.1 m/s) with a RMSE of 13.9 m/s (13.5 m/s), respectively.

Figure 4.5 shows histograms of central pressure errors and maximum wind speed errors in 30-hour GSM predictions. It can be seen that the GSM has a small positive bias for central pressure prediction (left) and tends to underestimate the wind speed of TCs (right). This underestimation occurs because the model's current horizontal resolution (about 20 km) is not fine enough to produce the TC core structure, especially when the TC is intense and small.

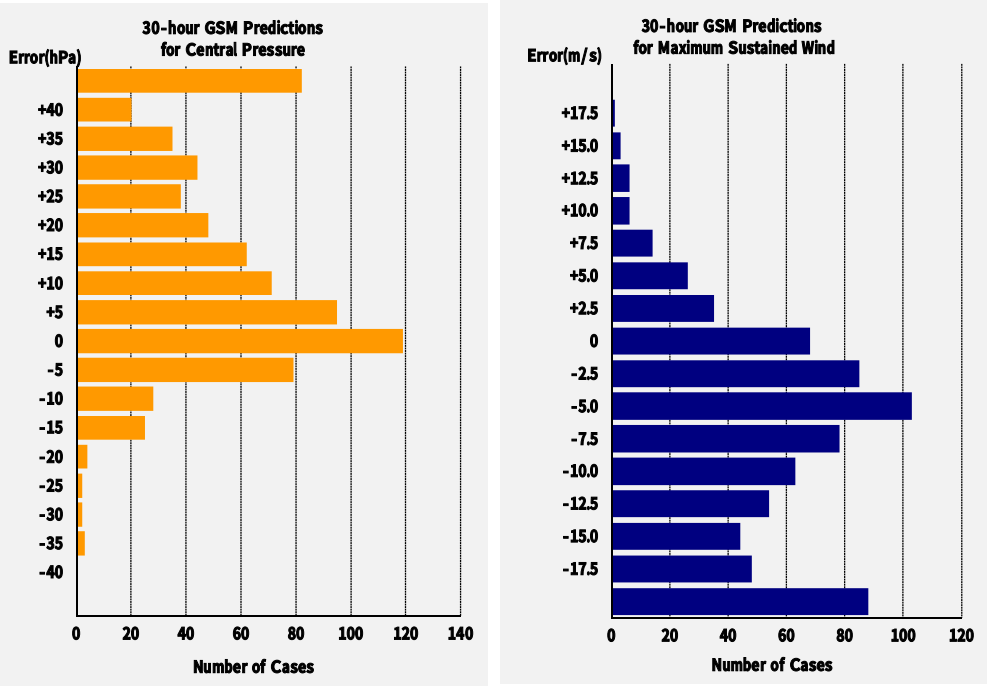


Figure 4.5 Error distribution of GSM 30-hour intensity predictions in 2015.
The figure on the left shows error distribution for central pressure, while the one on the right shows that for maximum wind speed (the error distributions of 54- and 78-hour predictions are included on the DVD provided with this report).

### 4.2.2 TEPS Prediction

#### 1) Ensemble mean center position

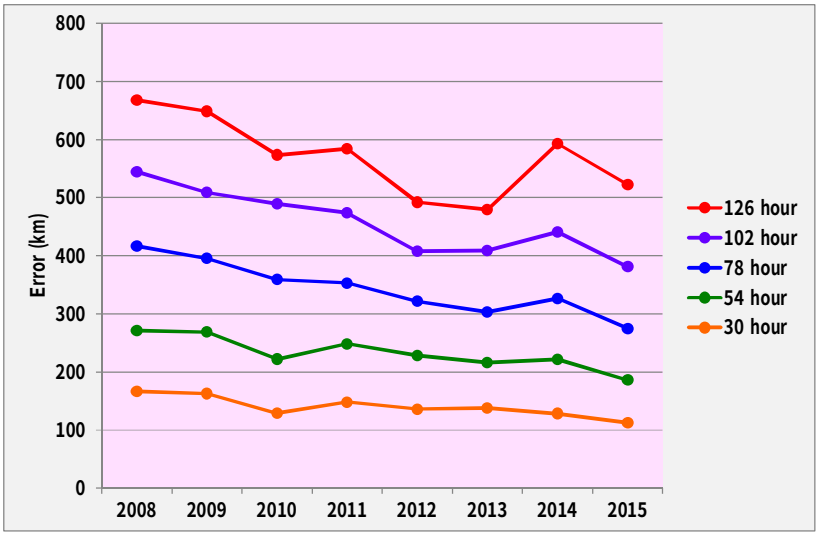


Figure 4.6 TEPS annual mean position errors since 2008

TEPS annual mean position errors observed since 2008 are presented in Figure 4.6. In 2015, the mean position errors of TEPS ensemble mean forecasts for 30-, 54-, 78-, 102- and 126-hour predictions for each TC are given in Table 4.6. The annual means of ensemble mean position errors for 30-, 54-, 78-, 102- and 126-hour predictions were 113 km (109 km with the GSM), 186 km (173 km), 275 km (256 km), 381 km and 522 km, respectively.

Table 4.6 Mean position errors (km) of TEPS ensemble mean forecasts for each TC forming in 2015. The number of samples is given in parentheses.

| Tropical Cyclone | | | T=30 | | T=54 | | T=78 | | T=102 | | T=126 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| STS | MEKKHALA | (1501) | 74.2 | (16) | 114.1 | (12) | 122.7 | (8) | 162.5 | (4) | - | (-) |
| TY | HIGOS | (1502) | 135.2 | (14) | 244.8 | (10) | 428.7 | (6) | 828.2 | (2) | - | (-) |
| TS | BAVI | (1503) | 131.3 | (22) | 219.8 | (18) | 299.1 | (14) | 358.7 | (10) | 419.7 | (6) |
| TY | MAYSAK | (1504) | 86.3 | (32) | 192.4 | (28) | 304.5 | (24) | 382.0 | (20) | 440.4 | (16) |
| TS | HAISHEN | (1505) | 68.2 | (3) | - | (-) | - | (-) | - | (-) | - | (-) |
| TY | NOUL | (1506) | 109.8 | (35) | 173.9 | (31) | 209.7 | (27) | 302.0 | (23) | 382.2 | (19) |
| TY | DOLPHIN | (1507) | 102.2 | (52) | 202.2 | (48) | 336.9 | (44) | 454.1 | (40) | 576.1 | (36) |
| TS | KUJIRA | (1508) | 140.4 | (11) | 277.3 | (7) | - | (-) | - | (-) | - | (-) |
| TY | CHAN-HOM | (1509) | 100.0 | (47) | 130.0 | (40) | 216.6 | (36) | 301.8 | (32) | 376.0 | (28) |
| STS | LINFA | (1510) | 147.9 | (28) | 247.1 | (24) | 362.2 | (19) | 379.3 | (11) | 413.2 | (9) |
| TY | NANGKA | (1511) | 88.7 | (54) | 150.8 | (50) | 203.3 | (46) | 225.6 | (42) | 260.1 | (38) |
| TY | HALOLA | (1512) | 102.2 | (45) | 162.7 | (41) | 207.8 | (37) | 277.0 | (33) | 343.3 | (29) |
| TY | SOUDELOR | (1513) | 110.0 | (37) | 184.7 | (33) | 243.7 | (29) | 295.8 | (25) | 410.4 | (21) |
| TS | MOLAVE | (1514) | 113.5 | (26) | 122.2 | (22) | 167.2 | (18) | 272.0 | (14) | 521.7 | (10) |
| TY | GONI | (1515) | 113.4 | (43) | 205.0 | (39) | 328.6 | (35) | 452.7 | (31) | 625.5 | (27) |
| TY | ATSANI | (1516) | 113.2 | (40) | 165.3 | (36) | 252.6 | (32) | 408.2 | (28) | 625.7 | (24) |
| TY | KILO | (1517) | 70.1 | (34) | 124.6 | (30) | 219.5 | (26) | 344.5 | (22) | 515.9 | (18) |
| STS | ETAU | (1518) | 244.1 | (8) | 492.2 | (4) | - | (-) | - | (-) | - | (-) |
| TS | VAMCO | (1519) | 107.6 | (2) | - | (-) | - | (-) | - | (-) | - | (-) |
| TY | KROVANH | (1520) | 141.4 | (22) | 279.4 | (18) | 452.1 | (14) | 637.8 | (10) | 853.5 | (6) |
| TY | DUJUAN | (1521) | 111.1 | (27) | 177.1 | (23) | 317.6 | (19) | 616.3 | (15) | 1307.2 | (11) |
| TY | MUJIGAE | (1522) | 79.4 | (10) | 142.2 | (6) | 316.1 | (2) | - | (-) | - | (-) |
| STS | CHOI-WAN | (1523) | 100.4 | (22) | 116.4 | (18) | 194.0 | (14) | 276.6 | (10) | 437.7 | (6) |
| TY | KOPPU | (1524) | 119.3 | (29) | 194.5 | (25) | 288.3 | (21) | 379.0 | (17) | 482.1 | (13) |
| TY | CHAMPI | (1525) | 136.0 | (45) | 239.5 | (41) | 408.4 | (37) | 657.6 | (33) | 976.2 | (29) |
| TY | IN-FA | (1526) | 177.6 | (30) | 284.1 | (26) | 333.4 | (22) | 405.4 | (18) | 385.8 | (14) |
| TY | MELOR | (1527) | 103.1 | (21) | 135.0 | (17) | 169.5 | (12) | 206.0 | (8) | 341.4 | (4) |
| All Mean (Total) | | | 112.6 | (755) | 186.1 | (647) | 274.7 | (542) | 381.3 | (448) | 522.4 | (364) |

### 2) Spread-skill relationship

Although position errors of TEPS ensemble mean forecasts were larger than those of the GSM in short-range forecasts, TEPS provides useful information on the reliability of TC track forecasts with its ensemble spread. Figure 4.7 shows the relationship between 6-hourly cumulative ensemble spreads in TC position forecasts and ensemble mean forecast position errors in 126-hour prediction. In an ideal EPS with a large number of samples, a significant position error is observed when the ensemble spread is large.

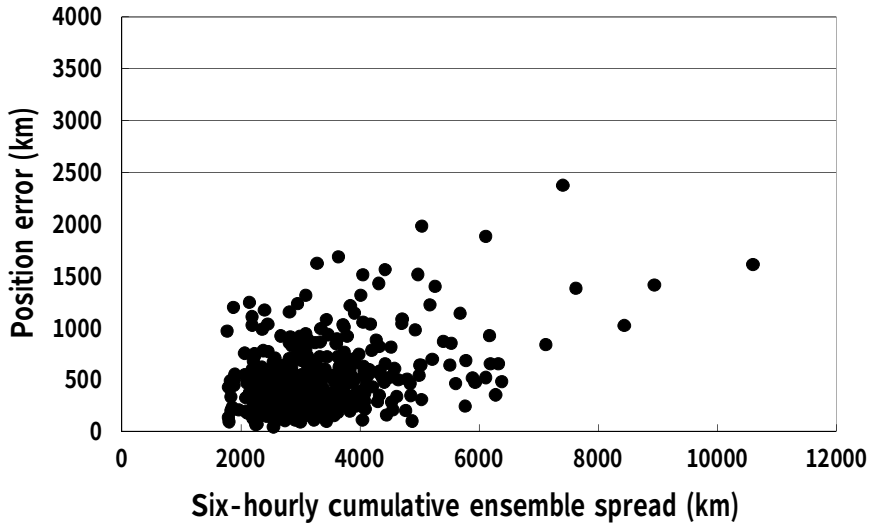


Figure 4.7 Relationship between six-hourly cumulative ensemble spread in TC position forecasts (km) and ensemble mean forecast position errors (km) in 126-hour predictions in 2015.

To add reliability information to TC track forecasts, JMA has introduced a reliability index in which the categories A, B and C represent the highest, middle and lowest levels of reliability, respectively. The index is based on the six-hourly cumulative ensemble spread at each forecast time. The category levels were set from the results of the pre-operational running of TEPS so that the category frequencies are 40%, 40% and 20%, respectively. Table 4.7 shows ensemble mean forecast errors classified with the reliability index. Theoretically, mean position errors with reliability level A should be smaller than those with levels B and C throughout the forecast times with a sufficient number of samples in an ideal EPS. The results show that TEPS provides appropriate reliability information on 2015 TC track forecasts.

Table 4.7 Ensemble mean forecast position errors (km) in 2015 classified with six-hourly cumulative ensemble spread at each forecast time. The number of samples is given in parentheses.

| | Reliability Index | | | | | |
|---|---|---|---|---|---|---|
| Time | A | | B | | C | |
| T=30 | 100.6 | (491) | 129.1 | (265) | 188.0 | (38) |
| T=54 | 175.5 | (491) | 200.9 | (170) | 303.0 | (29) |
| T=78 | 256.0 | (440) | 321.6 | (134) | 448.6 | (17) |
| T=102 | 353.0 | (374) | 432.2 | (113) | 614.2 | (15) |
| T=126 | 455.2 | (309) | 630.1 | (86) | 1083.6 | (13) |

### 4.3 Verification of Storm Surge Prediction

Storm surge predictions have been provided since 2011via the Numerical Typhoon Prediction website to Typhoon Committee Members within the framework of the Storm Surge Watch Scheme (SSWS) (for details of the storm surge model, refer to Hasegawa et al. (2012) on the RSMC Tokyo website). Verification of time-series storm surge prediction was conducted on data from eight stations (Table 4.8) for which tide observation information is provided on the University of Hawaii Sea Level Center (UHSLC) database website (http://uhslc.soest.hawaii.edu/data/?fd) for all typhoons in 2015, and on data from stations in Japan for Typhoon Goni (1515).

Hourly hindcast data (from FT = -5 to FT = 0) and forecast data (from FT = 1 to FT = 72) were compared with observation data.

Table 4.8 Stations used for verification

| | Station | | Member |
|---|---|---|---|
| 1 | Quarry Bay | QB | Hong Kong |
| 2 | Langkawi | LK | Malaysia |
| 3 | Legaspi Port | LG | Philippines |
| 4 | Manila South Harbor | ML | Philippines |
| 5 | Subic Bay | SB | Philippines |
| 6 | Apra Harbor | AP | U.S.A. |
| 7 | Qui Nhon | QN | Viet Nam |
| 8 | Vung Tau | VT | Viet Nam |

### 1) Verification of data from the eight stations for all typhoons in 2015

No significant storm surges were observed at any of the eight stations in 2015 (Table 4.9). Figure 4.8 shows a scatter diagram of model storm surges (hindcast and forecast) against observation data. The root mean square errors (RMSEs; unit: m) were 0.085 (hindcast) and 0.087 (forecast), and the correlations were 0.35 and 0.32, respectively. Forecast data tended to overestimate storm surges because the typhoon bogus, which expresses wind and pressure fields based on parametric TC modeling, does not incorporate consideration of structural changes and wind mitigation caused by land topography.

Table 4.9 Maximum storm surges observed at the eight stations for each typhoon in 2015 (unit: m)

| | T1501 | T1502 | T1503 | T1504 | T1505 | T1506 | T1507 | T1508 | T1509 | T1510 |
|---|---|---|---|---|---|---|---|---|---|---|
| QB | 0.29 | 0.33 | 0.2 | 0.06 | 0.02 | 0.08 | 0.09 | 0.23 | 0.39 | 0.39 |
| LK | 0.14 | 0.06 | 0.04 | 0.06 | -0.01 | 0.07 | 0.15 | 0.16 | 0.22 | 0.22 |
| LG | 0.05 | 0.13 | 0.06 | 0.09 | 0.09 | 0.07 | 0.07 | 0.15 | 0.07 | 0.04 |
| ML | 0.09 | 0.1 | 0.03 | 0.09 | 0.1 | 0.08 | 0.08 | | | |
| SB | 0.15 | 0.16 | -0.01 | 0.1 | 0.1 | 0.03 | 0.03 | 0.11 | 0.14 | 0.13 |
| AP | 0.16 | 0.16 | 0.18 | 0.1 | 0.05 | 0.12 | 0.37 | 0.16 | 0.28 | 0.28 |
| QN | 0.2 | 0.16 | 0.06 | 0.12 | -0.03 | -0.03 | 0.02 | 0.12 | 0.23 | 0.23 |
| VT | 0.5 | 0.36 | 0.08 | 0.24 | -0.02 | -0.03 | 0.04 | 0.2 | 0.21 | 0.14 |

| | T1511 | T1512 | T1513 | T1514 | T1515 | T1516 | T1517 | T1518 | T1519 | T1520 |
|---|---|---|---|---|---|---|---|---|---|---|
| QB | 0.39 | 0.35 | 0.34 | 0.34 | 0.17 | 0.17 | 0.09 | 0.09 | 0.26 | 0.12 |
| LK | 0.22 | 0.22 | 0.16 | 0.16 | 0.13 | 0.13 | 0.1 | 0.03 | 0.08 | 0.12 |
| LG | 0.12 | 0.12 | 0.07 | 0.05 | 0.16 | 0.16 | 0.09 | 0.09 | 0.06 | 0.1 |
| ML | | | | | | | | | | |
| SB | 0.14 | 0.1 | 0.11 | 0.11 | 0.1 | 0.1 | 0.04 | 0.02 | 0.06 | 0.04 |
| AP | 0.28 | 0.15 | 0.15 | 0.03 | 0.02 | 0.02 | 0.08 | 0.06 | 0.03 | 0.1 |
| QN | 0.23 | 0.15 | 0.13 | 0.13 | 0.09 | 0.09 | 0.01 | -0.06 | 0.22 | 0.21 |
| VT | 0.21 | 0.28 | 0.23 | 0.21 | 0.2 | 0.2 | 0.03 | -0.03 | 0.14 | 0.24 |

| | T1521 | T1522 | T1523 | T1524 | T1525 | T1526 | T1527 |
|---|---|---|---|---|---|---|---|
| QB | 0.24 | 0.35 | 0.35 | 0.22 | 0.22 | 0.21 | 0.15 |
| LK | 0.19 | 0.03 | 0.04 | 0.04 | 0.04 | | |
| LG | 0.14 | 0.06 | 0.13 | 0.23 | 0.23 | 0.12 | 0.53 |
| ML | | | | | | | |
| SB | 0.05 | 0.03 | 0.07 | 0.11 | 0.11 | 0.1 | 0.19 |
| AP | 0.04 | -0.03 | 0.02 | 0.06 | 0.06 | 0.1 | 0.01 |
| QN | 0.05 | 0.02 | 0.02 | 0.13 | 0.12 | 0.1 | 0.15 |
| VT | 0.01 | 0.03 | 0.08 | 0.3 | 0.29 | 0.14 | 0.21 |

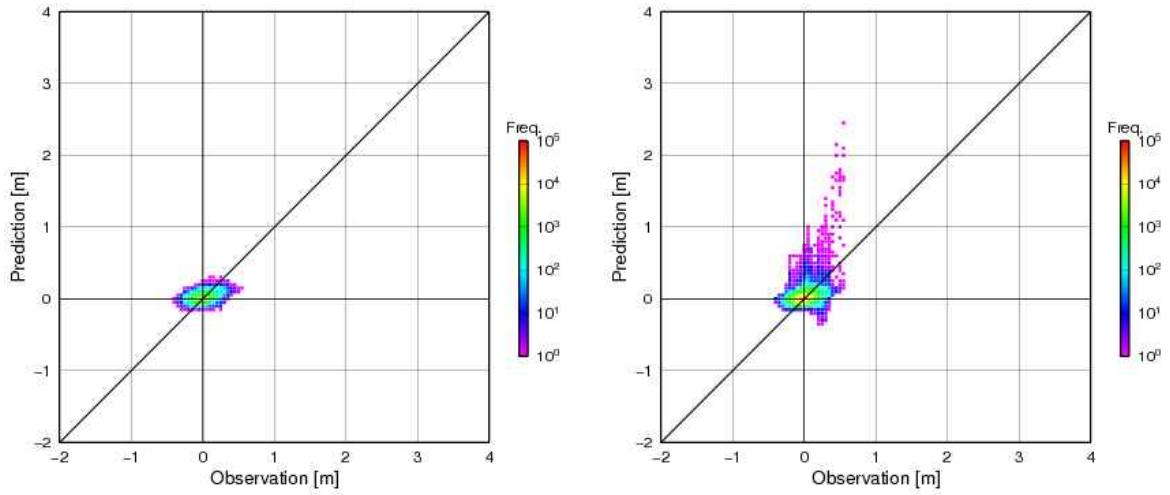


Figure 4.8 Scatter diagram of model storm surges against observation data from the eight stations for all typhoons in 2015 (left: hindcast; right: forecast)

### 2) Verification of data from stations in Japan for Typhoon Goni (1515)

Typhoon Goni (1515) generated considerable storm surges exceeding 1 m according to height observation data from tidal stations in Japan. Figure 4.9 shows a scatter diagram of model storm surges (hindcast and forecast) against observation data for Typhoon Goni (1515) involving 13 forecasts. The RMSEs were 0.091 (hindcast) and 0.130 (forecast), and the correlations were 0.63 and 0.41, respectively.

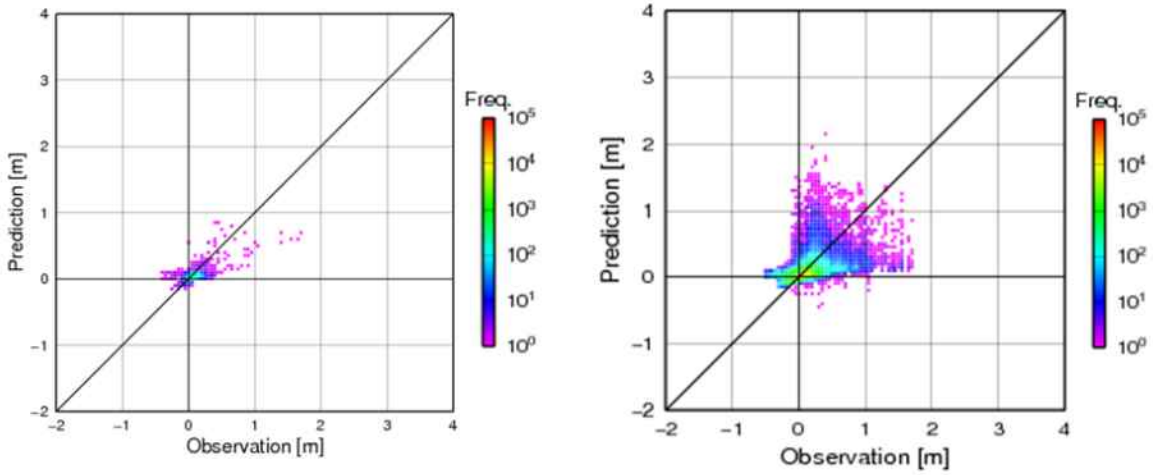


Figure 4.9 Scatter diagram of model storm surges against observation data from stations in Japan for T1515 (left: hindcast; right: forecast)

[Reference]

Hasegawa.H., N.Kohno, and H.Hayashibara, 2012: JMA's Storm Surge Prediction for the WMO Storm Surge Watch Scheme (SSWS). *RSMC Tokyo-Typhoon Center Technical Review*, **14**, 13-24.

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# RSMC Tropical Cyclone Best Track Data in 2015

**Appendix 1**

### Mekkhala (1501)

| Date/Time (UTC) | | Center position Lat (N) | Lon (E) | Central pressure (hPa) | Max wind (kt) | CI num. | Grade |
|---|---|---|---|---|---|---|---|
| Jan. | 13/00 | 8.7 | 142.9 | 1006 | - | 0.5 | TD |
| | 13/06 | 8.5 | 142.4 | 1004 | - | 0.5 | TD |
| | 13/12 | 8.6 | 141.7 | 1002 | 35 | 1.0 | TS |
| | 13/18 | 9.2 | 140.7 | 1002 | 35 | 1.5 | TS |
| | 14/00 | 10.1 | 139.5 | 1002 | 35 | 1.5 | TS |
| | 14/06 | 10.3 | 138.4 | 1000 | 35 | 2.0 | TS |
| | 14/12 | 10.9 | 137.1 | 1000 | 35 | 2.0 | TS |
| | 14/18 | 11.3 | 135.6 | 1000 | 35 | 2.5 | TS |
| | 15/00 | 11.4 | 134.2 | 998 | 35 | 2.5 | TS |
| | 15/06 | 11.6 | 133.2 | 996 | 35 | 2.5 | TS |
| | 15/12 | 11.7 | 132.7 | 994 | 40 | 2.5 | TS |
| | 15/18 | 11.6 | 131.7 | 992 | 40 | 3.0 | TS |
| | 16/00 | 11.3 | 130.7 | 990 | 45 | 3.0 | TS |
| | 16/06 | 11.3 | 129.3 | 985 | 50 | 3.5 | STS |
| | 16/12 | 11.2 | 128.5 | 980 | 50 | 4.0 | STS |
| | 16/18 | 11.0 | 127.5 | 975 | 60 | 4.5 | STS |
| | 17/00 | 11.4 | 126.7 | 975 | 60 | 4.5 | STS |
| | 17/06 | 11.9 | 126.0 | 975 | 60 | 4.5 | STS |
| | 17/12 | 12.4 | 125.2 | 990 | 45 | 4.5 | TS |
| | 17/18 | 12.7 | 124.3 | 992 | 40 | 4.0 | TS |
| | 18/00 | 13.5 | 123.6 | 996 | 35 | 3.5 | TS |
| | 18/06 | 13.9 | 122.9 | 996 | 35 | 3.0 | TS |
| | 18/12 | 14.8 | 122.6 | 1000 | 35 | 2.5 | TS |
| | 18/18 | 16.0 | 122.5 | 1004 | - | 2.0 | TD |
| | 19/00 | 16.6 | 122.8 | 1010 | - | - | TD |
| | 19/06 | 16.8 | 123.1 | 1010 | - | - | TD |
| | 19/12 | 16.8 | 123.3 | 1012 | - | - | TD |
| | 19/18 | 16.8 | 123.9 | 1012 | - | - | TD |
| | 20/00 | 16.8 | 124.4 | 1012 | - | - | TD |
| | 20/06 | 16.9 | 124.7 | 1012 | - | - | TD |
| | 20/12 | 17.0 | 125.0 | 1012 | - | - | TD |
| | 20/18 | 17.3 | 125.2 | 1012 | - | - | TD |
| | 21/00 | | | | | | Dissip. |

### Higos (1502)

| Date/Time (UTC) | | Center position Lat (N) | Lon (E) | Central pressure (hPa) | Max wind (kt) | CI num. | Grade |
|---|---|---|---|---|---|---|---|
| Feb. | 06/12 | 8.6 | 158.3 | 1008 | - | 0.5 | TD |
| | 06/18 | 9.1 | 157.9 | 1006 | - | 0.5 | TD |
| | 07/00 | 9.7 | 157.7 | 1004 | - | 1.0 | TD |
| | 07/06 | 10.3 | 157.4 | 1004 | - | 1.5 | TD |
| | 07/12 | 10.8 | 157.5 | 1004 | - | 2.0 | TD |
| | 07/18 | 11.6 | 157.5 | 1000 | 35 | 2.5 | TS |
| | 08/00 | 11.9 | 157.3 | 996 | 40 | 3.0 | TS |
| | 08/06 | 12.0 | 157.0 | 990 | 45 | 3.0 | TS |
| | 08/12 | 11.9 | 156.9 | 990 | 45 | 3.0 | TS |
| | 08/18 | 11.9 | 156.7 | 985 | 50 | 3.5 | STS |
| | 09/00 | 12.1 | 156.4 | 985 | 50 | 3.5 | STS |
| | 09/06 | 12.3 | 156.1 | 980 | 55 | 4.0 | STS |
| | 09/12 | 12.6 | 155.7 | 975 | 60 | 4.0 | STS |
| | 09/18 | 13.0 | 155.2 | 965 | 70 | 4.5 | TY |
| | 10/00 | 13.6 | 154.7 | 955 | 80 | 5.0 | TY |
| | 10/06 | 14.2 | 154.2 | 940 | 90 | 5.5 | TY |
| | 10/12 | 14.7 | 154.1 | 955 | 80 | 5.5 | TY |
| | 10/18 | 15.0 | 153.6 | 975 | 65 | 5.5 | TY |
| | 11/00 | 15.3 | 153.2 | 990 | 50 | 5.0 | STS |
| | 11/06 | 15.5 | 152.8 | 994 | 40 | 4.5 | TS |
| | 11/12 | 16.1 | 152.5 | 1002 | - | 4.0 | TD |
| | 11/18 | 16.5 | 152.2 | 1004 | - | 3.5 | TD |
| | 12/00 | 16.6 | 152.1 | 1006 | - | - | TD |
| | 12/06 | 17.4 | 152.6 | 1004 | - | - | TD |
| | 12/12 | 18.2 | 152.8 | 1008 | - | - | TD |
| | 12/18 | | | | | | Dissip. |

### Bavi (1503)

| Date/Time (UTC) | | Center position Lat (N) | Lon (E) | Central pressure (hPa) | Max wind (kt) | CI num. | Grade |
|---|---|---|---|---|---|---|---|
| Mar. | 10/06 | 4.3 | 173.4 | 998 | - | 0.5 | TD |
| | 10/12 | 5.4 | 172.7 | 998 | - | 0.5 | TD |
| | 10/18 | 6.3 | 171.8 | 998 | - | 0.5 | TD |
| | 11/00 | 6.7 | 170.9 | 998 | - | 1.0 | TD |
| | 11/06 | 6.8 | 170.0 | 996 | 35 | 1.5 | TS |
| | 11/12 | 6.8 | 169.0 | 996 | 35 | 1.5 | TS |
| | 11/18 | 7.3 | 168.1 | 996 | 35 | 2.0 | TS |
| | 12/00 | 7.4 | 166.9 | 994 | 35 | 2.0 | TS |
| | 12/06 | 8.1 | 166.1 | 994 | 35 | 2.0 | TS |
| | 12/12 | 8.3 | 164.0 | 992 | 40 | 2.5 | TS |
| | 12/18 | 8.4 | 162.5 | 992 | 40 | 2.5 | TS |
| | 13/00 | 8.7 | 160.8 | 992 | 40 | 2.5 | TS |
| | 13/06 | 9.0 | 159.9 | 992 | 40 | 2.5 | TS |
| | 13/12 | 9.8 | 158.6 | 992 | 40 | 2.5 | TS |
| | 13/18 | 11.0 | 156.9 | 990 | 45 | 2.5 | TS |
| | 14/00 | 11.7 | 154.5 | 990 | 45 | 3.0 | TS |
| | 14/06 | 12.6 | 152.6 | 990 | 45 | 3.0 | TS |
| | 14/12 | 13.5 | 151.0 | 990 | 45 | 3.0 | TS |
| | 14/18 | 14.0 | 149.4 | 990 | 45 | 3.0 | TS |
| | 15/00 | 14.2 | 148.0 | 990 | 45 | 3.0 | TS |
| | 15/06 | 14.3 | 146.6 | 990 | 45 | 3.0 | TS |
| | 15/12 | 13.2 | 145.2 | 992 | 45 | 3.0 | TS |
| | 15/18 | 13.1 | 142.3 | 994 | 40 | 2.5 | TS |
| | 16/00 | 13.4 | 141.0 | 996 | 35 | 2.5 | TS |
| | 16/06 | 14.1 | 139.6 | 996 | 35 | 2.5 | TS |
| | 16/12 | 14.5 | 138.4 | 996 | 35 | 2.5 | TS |
| | 16/18 | 14.9 | 137.3 | 996 | 35 | 2.5 | TS |
| | 17/00 | 15.1 | 136.4 | 996 | 35 | 2.5 | TS |
| | 17/06 | 15.3 | 135.4 | 998 | 35 | 2.5 | TS |
| | 17/12 | 15.4 | 134.5 | 1000 | - | 2.0 | TD |
| | 17/18 | 15.7 | 133.4 | 1002 | - | 2.0 | TD |
| | 18/00 | 15.9 | 133.0 | 1004 | - | 2.0 | TD |
| | 18/06 | 16.1 | 132.0 | 1004 | - | 2.0 | TD |
| | 18/12 | 16.1 | 131.2 | 1008 | - | 1.5 | TD |
| | 18/18 | 16.1 | 130.6 | 1008 | - | 1.5 | TD |
| | 19/00 | 16.1 | 129.9 | 1010 | - | 1.5 | TD |
| | 19/06 | 15.6 | 129.0 | 1008 | - | 1.5 | TD |
| | 19/12 | 15.4 | 128.2 | 1010 | - | 1.0 | TD |
| | 19/18 | 15.2 | 127.5 | 1008 | - | 1.0 | TD |
| | 20/00 | 15.0 | 126.7 | 1008 | - | 1.0 | TD |
| | 20/06 | 14.6 | 125.9 | 1008 | - | 1.0 | TD |
| | 20/12 | 14.6 | 125.1 | 1010 | - | 0.5 | TD |
| | 20/18 | 14.6 | 124.3 | 1008 | - | 0.5 | TD |
| | 21/00 | 14.4 | 123.5 | 1010 | - | 0.5 | TD |
| | 21/06 | 14.1 | 122.6 | 1010 | - | 0.5 | TD |
| | 21/12 | 13.8 | 121.7 | 1010 | - | - | TD |
| | 21/18 | | | | | | Dissip. |

### Maysak (1504)

| Date/Time (UTC) | | Center position Lat (N) | Lon (E) | Central pressure (hPa) | Max wind (kt) | CI num. | Grade |
|---|---|---|---|---|---|---|---|
| Mar. | 26/12 | 6.7 | 159.9 | 1008 | - | 1.0 | TD |
| | 26/18 | 6.9 | 159.2 | 1006 | - | 1.0 | TD |
| | 27/00 | 7.2 | 158.5 | 1008 | - | 1.5 | TD |
| | 27/06 | 7.4 | 157.9 | 1006 | - | 2.0 | TD |
| | 27/12 | 7.7 | 157.4 | 1006 | - | 2.0 | TD |
| | 27/18 | 7.8 | 156.8 | 1002 | 35 | 2.5 | TS |
| | 28/00 | 7.8 | 155.5 | 998 | 35 | 2.5 | TS |
| | 28/06 | 7.6 | 154.4 | 994 | 45 | 3.0 | TS |
| | 28/12 | 7.3 | 153.9 | 985 | 50 | 3.0 | STS |
| | 28/18 | 7.4 | 153.1 | 980 | 55 | 3.5 | STS |
| | 29/00 | 7.6 | 152.2 | 970 | 65 | 4.0 | TY |
| | 29/06 | 7.8 | 151.1 | 965 | 70 | 4.5 | TY |
| | 29/12 | 8.0 | 149.5 | 950 | 80 | 5.0 | TY |
| | 29/18 | 8.1 | 148.0 | 950 | 80 | 5.0 | TY |
| | 30/00 | 8.5 | 146.9 | 950 | 80 | 5.0 | TY |
| | 30/06 | 8.8 | 145.7 | 950 | 80 | 5.0 | TY |
| | 30/12 | 9.0 | 144.9 | 940 | 85 | 5.5 | TY |
| | 30/18 | 9.4 | 143.7 | 925 | 95 | 6.0 | TY |
| | 31/00 | 9.6 | 142.5 | 915 | 100 | 6.5 | TY |
| | 31/06 | 10.0 | 141.3 | 910 | 105 | 7.0 | TY |
| | 31/12 | 10.2 | 139.9 | 910 | 105 | 7.0 | TY |
| | 31/18 | 10.3 | 138.7 | 910 | 105 | 7.0 | TY |
| Apr. | 01/00 | 10.7 | 137.7 | 910 | 105 | 7.0 | TY |
| | 01/06 | 11.2 | 136.6 | 910 | 105 | 7.0 | TY |
| | 01/12 | 11.7 | 135.7 | 910 | 105 | 7.0 | TY |
| | 01/18 | 12.0 | 134.7 | 910 | 105 | 7.0 | TY |
| | 02/00 | 12.3 | 134.0 | 925 | 95 | 6.5 | TY |
| | 02/06 | 12.8 | 133.4 | 940 | 85 | 6.0 | TY |
| | 02/12 | 13.2 | 132.6 | 940 | 85 | 6.0 | TY |
| | 02/18 | 13.7 | 132.0 | 940 | 85 | 6.0 | TY |
| | 03/00 | 13.9 | 131.1 | 945 | 85 | 5.5 | TY |
| | 03/06 | 14.1 | 130.0 | 950 | 80 | 5.5 | TY |
| | 03/12 | 14.1 | 129.0 | 955 | 75 | 5.0 | TY |
| | 03/18 | 14.3 | 127.8 | 960 | 75 | 5.0 | TY |
| | 04/00 | 14.7 | 126.6 | 965 | 70 | 4.5 | TY |
| | 04/06 | 15.2 | 125.1 | 980 | 55 | 4.0 | STS |
| | 04/12 | 15.7 | 123.8 | 985 | 50 | 3.5 | STS |
| | 04/18 | 16.0 | 123.0 | 996 | 40 | 3.0 | TS |
| | 05/00 | 16.2 | 122.6 | 1000 | 35 | 2.5 | TS |
| | 05/06 | 18.6 | 121.1 | 1004 | - | 2.5 | TD |
| | 05/12 | 19.5 | 119.4 | 1008 | - | - | TD |
| | 05/18 | 20.3 | 118.2 | 1008 | - | - | TD |
| | 06/00 | 20.3 | 117.4 | 1008 | - | - | TD |
| | 06/06 | 20.1 | 117.2 | 1008 | - | - | TD |
| | 06/12 | 20.0 | 117.3 | 1008 | - | - | TD |
| | 06/18 | 20.3 | 117.2 | 1008 | - | - | TD |
| | 07/00 | 20.6 | 116.8 | 1010 | - | - | TD |
| | 07/06 | | | | | | Dissip. |

### Haishen (1505)

| Date/Time (UTC) | | Center position Lat (N) | Lon (E) | Central pressure (hPa) | Max wind (kt) | CI num. | Grade |
|---|---|---|---|---|---|---|---|
| Apr. | 02/18 | 7.3 | 156.9 | 1004 | - | 0.0 | TD |
| | 03/00 | 7.6 | 156.4 | 1006 | - | 0.0 | TD |
| | 03/06 | 8.1 | 155.3 | 1004 | - | 0.5 | TD |
| | 03/12 | 8.3 | 154.5 | 1006 | - | 0.5 | TD |
| | 03/18 | 8.5 | 153.8 | 1004 | - | 0.5 | TD |
| | 04/00 | 8.6 | 153.3 | 1004 | - | 1.0 | TD |
| | 04/06 | 8.7 | 152.3 | 1000 | 35 | 1.5 | TS |
| | 04/12 | 9.0 | 152.0 | 1000 | 35 | 2.0 | TS |
| | 04/18 | 9.1 | 151.6 | 998 | 35 | 2.0 | TS |
| | 05/00 | 9.0 | 151.3 | 998 | 35 | 2.0 | TS |
| | 05/06 | 8.9 | 150.9 | 998 | 35 | 2.0 | TS |
| | 05/12 | 8.9 | 150.8 | 1000 | - | 2.0 | TD |
| | 05/18 | 8.9 | 150.7 | 1000 | - | 1.5 | TD |
| | 06/00 | 8.9 | 150.7 | 1004 | - | - | TD |
| | 06/06 | | | | | | Dissip. |

## Noul (1506)

| Date/Time (UTC) | | Center position Lat (N) | Center position Lon (E) | Central pressure (hPa) | Max wind (kt) | CI num. | Grade |
|---|---|---|---|---|---|---|---|
| May | 02/06 | 7.4 | 144.1 | 1006 | - | 1.0 | TD |
| | 02/12 | 7.8 | 143.1 | 1006 | - | 1.0 | TD |
| | 02/18 | 8.0 | 142.5 | 1006 | - | 1.5 | TD |
| | 03/00 | 8.2 | 142.1 | 1006 | - | 1.5 | TD |
| | 03/06 | 8.5 | 141.5 | 1004 | - | 1.5 | TD |
| | 03/12 | 9.1 | 141.1 | 1004 | - | 2.0 | TD |
| | 03/18 | 9.4 | 140.7 | 1000 | 35 | 2.0 | TS |
| | 04/00 | 9.6 | 140.2 | 998 | 35 | 2.0 | TS |
| | 04/06 | 9.6 | 139.9 | 996 | 35 | 2.0 | TS |
| | 04/12 | 9.5 | 139.6 | 996 | 40 | 2.5 | TS |
| | 04/18 | 9.5 | 139.3 | 994 | 40 | 3.0 | TS |
| | 05/00 | 9.4 | 139.1 | 992 | 45 | 3.0 | TS |
| | 05/06 | 9.3 | 138.8 | 992 | 45 | 3.0 | TS |
| | 05/12 | 9.3 | 138.5 | 990 | 50 | 3.5 | STS |
| | 05/18 | 9.3 | 138.3 | 985 | 60 | 4.0 | STS |
| | 06/00 | 9.4 | 137.6 | 985 | 60 | 4.0 | STS |
| | 06/06 | 9.5 | 136.9 | 980 | 65 | 4.5 | TY |
| | 06/12 | 9.8 | 136.1 | 970 | 75 | 5.0 | TY |
| | 06/18 | 10.1 | 135.2 | 960 | 80 | 5.0 | TY |
| | 07/00 | 10.6 | 134.2 | 960 | 80 | 5.0 | TY |
| | 07/06 | 11.3 | 133.1 | 960 | 80 | 5.0 | TY |
| | 07/12 | 11.6 | 132.0 | 955 | 85 | 5.0 | TY |
| | 07/18 | 11.8 | 131.1 | 955 | 85 | 5.0 | TY |
| | 08/00 | 12.1 | 130.3 | 955 | 85 | 5.0 | TY |
| | 08/06 | 12.6 | 129.2 | 955 | 85 | 5.0 | TY |
| | 08/12 | 13.4 | 128.0 | 955 | 85 | 5.0 | TY |
| | 08/18 | 13.7 | 127.3 | 955 | 85 | 5.0 | TY |
| | 09/00 | 14.3 | 126.4 | 955 | 85 | 5.0 | TY |
| | 09/06 | 14.9 | 125.2 | 945 | 90 | 6.0 | TY |
| | 09/12 | 15.4 | 124.6 | 945 | 90 | 6.0 | TY |
| | 09/18 | 16.1 | 123.9 | 935 | 100 | 6.5 | TY |
| | 10/00 | 17.0 | 123.3 | 920 | 110 | 7.5 | TY |
| | 10/06 | 17.8 | 122.6 | 920 | 110 | 7.5 | TY |
| | 10/12 | 18.6 | 122.4 | 925 | 105 | 7.5 | TY |
| | 10/18 | 19.6 | 122.1 | 930 | 100 | 6.5 | TY |
| | 11/00 | 20.6 | 122.0 | 945 | 90 | 6.5 | TY |
| | 11/06 | 21.7 | 122.2 | 960 | 80 | 5.5 | TY |
| | 11/09 | 22.6 | 123.1 | 970 | 75 | - | TY |
| | 11/12 | 23.4 | 123.6 | 975 | 70 | 5.0 | TY |
| | 11/15 | 24.5 | 124.6 | 980 | 70 | - | TY |
| | 11/18 | 25.9 | 125.7 | 980 | 65 | 5.0 | TY |
| | 11/21 | 27.0 | 127.0 | 980 | 65 | - | TY |
| | 12/00 | 28.0 | 128.4 | 985 | 65 | 4.5 | TY |
| | 12/03 | 29.2 | 130.3 | 990 | 60 | - | STS |
| | 12/06 | 30.4 | 132.2 | 994 | - | 4.0 | L |
| | 12/12 | 34.3 | 138.0 | 996 | - | - | L |
| | 12/18 | 38.2 | 142.2 | 996 | - | - | L |
| | 13/00 | 42.6 | 145.3 | 994 | - | - | L |
| | 13/06 | 44.2 | 147.9 | 992 | - | - | L |
| | 13/12 | 45.1 | 150.9 | 994 | - | - | L |
| | 13/18 | 45.6 | 153.6 | 994 | - | - | L |
| | 14/00 | 46.1 | 157.2 | 996 | - | - | L |
| | 14/06 | 46.8 | 160.3 | 996 | - | - | L |
| | 14/12 | 46.8 | 162.8 | 994 | - | - | L |
| | 14/18 | 47.1 | 165.8 | 990 | - | - | L |
| | 15/00 | 47.6 | 168.8 | 986 | - | - | L |
| | 15/06 | 48.3 | 171.6 | 986 | - | - | L |
| | 15/12 | 49.0 | 174.4 | 986 | - | - | L |
| | 15/18 | 49.0 | 176.8 | 986 | - | - | L |
| | 16/00 | 48.7 | 178.1 | 986 | - | - | L |
| | 16/06 | | | | | | Dissip. |

## Dolphin (1507)

| Date/Time (UTC) | | Center position Lat (N) | Center position Lon (E) | Central pressure (hPa) | Max wind (kt) | CI num. | Grade |
|---|---|---|---|---|---|---|---|
| May | 06/12 | 4.0 | 157.9 | 1004 | - | 0.5 | TD |
| | 06/18 | 4.0 | 158.7 | 1004 | - | 1.5 | TD |
| | 07/00 | 3.9 | 159.5 | 1004 | - | 1.5 | TD |
| | 07/06 | 3.6 | 160.2 | 1004 | - | 1.5 | TD |
| | 07/12 | 3.5 | 160.7 | 1004 | - | 1.5 | TD |
| | 07/18 | 3.3 | 161.1 | 1004 | - | 1.5 | TD |
| | 08/00 | 3.3 | 161.7 | 1004 | - | 2.0 | TD |
| | 08/06 | 3.4 | 162.1 | 1002 | - | 2.0 | TD |
| | 08/12 | 3.6 | 162.4 | 1004 | - | 2.0 | TD |
| | 08/18 | 3.9 | 162.6 | 1004 | - | 2.0 | TD |
| | 09/00 | 4.3 | 162.5 | 1004 | - | 2.0 | TD |
| | 09/06 | 4.7 | 162.4 | 1004 | - | 2.0 | TD |
| | 09/12 | 5.2 | 161.9 | 1000 | 35 | 2.0 | TS |
| | 09/18 | 5.7 | 161.0 | 1000 | 35 | 2.0 | TS |
| | 10/00 | 6.1 | 160.2 | 1000 | 35 | 2.5 | TS |
| | 10/06 | 6.7 | 160.0 | 1000 | 35 | 2.5 | TS |
| | 10/12 | 7.6 | 160.1 | 998 | 40 | 2.5 | TS |
| | 10/18 | 8.5 | 160.1 | 998 | 40 | 2.5 | TS |
| | 11/00 | 9.1 | 160.0 | 998 | 40 | 2.5 | TS |
| | 11/06 | 9.8 | 160.0 | 998 | 40 | 2.5 | TS |
| | 11/12 | 10.0 | 159.4 | 998 | 40 | 2.5 | TS |
| | 11/18 | 10.0 | 159.0 | 994 | 45 | 3.0 | TS |
| | 12/00 | 10.1 | 158.5 | 990 | 50 | 3.0 | STS |
| | 12/06 | 10.0 | 158.1 | 985 | 55 | 3.5 | STS |
| | 12/12 | 9.8 | 157.5 | 985 | 55 | 3.5 | STS |
| | 12/18 | 9.8 | 157.0 | 985 | 55 | 3.5 | STS |
| | 13/00 | 10.2 | 156.2 | 975 | 65 | 4.0 | TY |
| | 13/06 | 10.3 | 155.4 | 970 | 70 | 4.5 | TY |
| | 13/12 | 10.5 | 154.2 | 970 | 70 | 4.5 | TY |
| | 13/18 | 10.9 | 153.6 | 970 | 70 | 4.5 | TY |
| | 14/00 | 11.4 | 152.1 | 970 | 70 | 4.5 | TY |
| | 14/06 | 12.0 | 151.1 | 970 | 70 | 4.5 | TY |
| | 14/12 | 12.4 | 149.7 | 970 | 70 | 4.5 | TY |
| | 14/18 | 12.7 | 148.2 | 970 | 70 | 4.5 | TY |
| | 15/00 | 13.2 | 146.8 | 955 | 80 | 5.0 | TY |
| | 15/06 | 13.6 | 145.7 | 955 | 80 | 5.0 | TY |
| | 15/12 | 14.0 | 144.6 | 955 | 80 | 5.0 | TY |
| | 15/18 | 14.8 | 143.5 | 935 | 95 | 6.0 | TY |
| | 16/00 | 15.2 | 142.5 | 935 | 95 | 6.0 | TY |
| | 16/06 | 15.8 | 141.5 | 925 | 100 | 6.5 | TY |
| | 16/12 | 16.5 | 140.7 | 925 | 100 | 6.5 | TY |
| | 16/18 | 17.2 | 139.8 | 925 | 100 | 6.5 | TY |
| | 17/00 | 17.8 | 139.1 | 935 | 95 | 6.5 | TY |
| | 17/06 | 18.6 | 138.7 | 935 | 95 | 6.5 | TY |
| | 17/12 | 19 | 139 | 935 | 95 | 6.5 | TY |
| | 17/18 | 20.0 | 138.4 | 935 | 95 | 6.5 | TY |
| | 18/00 | 20.8 | 138.4 | 945 | 90 | 5.5 | TY |
| | 18/06 | 21.5 | 138.6 | 955 | 80 | 5.0 | TY |
| | 18/12 | 22.2 | 138.9 | 955 | 80 | 5.0 | TY |
| | 18/18 | 22.8 | 139.2 | 960 | 75 | 4.5 | TY |
| | 19/00 | 23.6 | 139.4 | 960 | 75 | 4.5 | TY |
| | 19/06 | 24.6 | 139.9 | 965 | 70 | 4.0 | TY |
| | 19/09 | 24.9 | 140.4 | 965 | 70 | - | TY |
| | 19/12 | 25.4 | 141.1 | 965 | 70 | 4.0 | TY |
| | 19/15 | 26.1 | 141.7 | 965 | 70 | - | TY |
| | 19/18 | 26.7 | 142.3 | 970 | 65 | 3.5 | TY |
| | 19/21 | 27.6 | 143.0 | 970 | 65 | - | TY |
| | 20/00 | 28.0 | 144.2 | 970 | 65 | 3.5 | TY |
| | 20/06 | 29.8 | 145.7 | 975 | 60 | 3.0 | STS |
| | 20/12 | 32.7 | 148.2 | 980 | 55 | 2.5 | STS |
| | 20/18 | 36.0 | 152.0 | 980 | 55 | 2.0 | STS |
| | 21/00 | 39.7 | 155.7 | 980 | - | - | L |
| | 21/06 | 43.3 | 160.3 | 980 | - | - | L |
| | 21/12 | 47.5 | 164.9 | 980 | - | - | L |
| | 21/18 | 50.8 | 167.9 | 978 | - | - | L |
| | 22/00 | 52.9 | 171.7 | 972 | - | - | L |
| | 22/06 | 55.0 | 172.1 | 970 | - | - | L |
| | 22/12 | 56.2 | 172.5 | 968 | - | - | L |
| | 22/18 | 56.6 | 172.6 | 968 | - | - | L |
| | 23/00 | 56.4 | 172.6 | 970 | - | - | L |
| | 23/06 | 56.1 | 173.3 | 972 | - | - | L |
| | 23/12 | 56.0 | 174.8 | 976 | - | - | L |
| | 23/18 | 55.7 | 176.4 | 980 | - | - | L |
| | 24/00 | 56.0 | 178.4 | 984 | - | - | L |
| | 24/06 | 56.1 | 180.3 | 986 | - | - | Out |

## Kujira (1508)

| Date/Time (UTC) | | Center position Lat (N) | Center position Lon (E) | Central pressure (hPa) | Max wind (kt) | CI num. | Grade |
|---|---|---|---|---|---|---|---|
| Jun. | 19/18 | 15.0 | 112.2 | 1002 | - | 0.5 | TD |
| | 20/00 | 15.0 | 111.9 | 1002 | - | 0.5 | TD |
| | 20/06 | 15.1 | 111.6 | 1000 | - | 1.0 | TD |
| | 20/12 | 15.2 | 111.5 | 998 | - | 1.5 | TD |
| | 20/18 | 15.4 | 111.4 | 998 | - | 1.5 | TD |
| | 21/00 | 15.6 | 111.4 | 996 | 35 | 2.0 | TS |
| | 21/06 | 16.4 | 111.4 | 990 | 40 | 2.0 | TS |
| | 21/12 | 16.8 | 111.6 | 985 | 45 | 2.0 | TS |
| | 21/18 | 17.7 | 111.3 | 985 | 45 | 2.0 | TS |
| | 22/00 | 18.1 | 111.2 | 985 | 45 | 2.5 | TS |
| | 22/06 | 18.5 | 110.9 | 985 | 45 | 2.5 | TS |
| | 22/12 | 18.5 | 110.1 | 985 | 45 | 2.0 | TS |
| | 22/18 | 18.7 | 109.6 | 990 | 35 | 2.0 | TS |
| | 23/00 | 19.6 | 109.1 | 990 | 35 | 2.5 | TS |
| | 23/06 | 19.7 | 108.6 | 990 | 40 | 2.5 | TS |
| | 23/12 | 19.8 | 108.1 | 990 | 40 | 2.5 | TS |
| | 23/18 | 20.1 | 107.5 | 990 | 40 | 2.5 | TS |
| | 24/00 | 20.4 | 107.3 | 985 | 45 | 2.5 | TS |
| | 24/06 | 20.7 | 106.9 | 990 | 40 | 2.5 | TS |
| | 24/12 | 21.3 | 106.6 | 992 | 35 | 2.5 | TS |
| | 24/18 | 21.6 | 106.3 | 996 | - | 2.0 | TD |
| | 25/00 | 22.4 | 105.9 | 998 | - | - | TD |
| | 25/06 | | | | | | Dissip. |

## Chan-hom (1509)

| Date/Time (UTC) | | Center position Lat (N) | Center position Lon (E) | Central pressure (hPa) | Max wind (kt) | CI num. | Grade |
|---|---|---|---|---|---|---|---|
| Jun. | 29/06 | 8.6 | 160.4 | 1004 | - | 0.0 | TD |
| | 29/12 | 8.9 | 160.6 | 1004 | - | 0.5 | TD |
| | 29/18 | 9.2 | 160.8 | 1002 | - | 1.0 | TD |
| | 30/00 | 9.6 | 160.8 | 1002 | - | 1.0 | TD |
| | 30/06 | 10.0 | 160.7 | 1000 | - | 1.5 | TD |
| | 30/12 | 10.3 | 160.4 | 998 | 35 | 2.0 | TS |
| | 30/18 | 10.8 | 159.7 | 996 | 40 | 2.0 | TS |
| Jul. | 01/00 | 10.9 | 159.0 | 994 | 40 | 2.5 | TS |
| | 01/06 | 11.1 | 158.3 | 994 | 40 | 2.5 | TS |
| | 01/12 | 11.5 | 156.1 | 990 | 45 | 3.0 | TS |
| | 01/18 | 11.7 | 154.0 | 985 | 50 | 3.0 | STS |
| | 02/00 | 11.4 | 152.1 | 985 | 50 | 3.5 | STS |
| | 02/06 | 10.8 | 150.3 | 985 | 50 | 3.5 | STS |
| | 02/12 | 10.0 | 149.0 | 980 | 55 | 3.5 | STS |
| | 02/18 | 9.8 | 148.0 | 980 | 55 | 3.5 | STS |
| | 03/00 | 10.3 | 147.9 | 980 | 55 | 3.5 | STS |
| | 03/06 | 10.8 | 148.0 | 985 | 50 | 3.5 | STS |
| | 03/12 | 11.4 | 148.5 | 990 | 45 | 3.0 | TS |
| | 03/18 | 12.2 | 148.6 | 990 | 45 | 3.0 | TS |
| | 04/00 | 12.7 | 148.0 | 990 | 45 | 3.0 | TS |
| | 04/06 | 13.2 | 147.1 | 990 | 45 | 3.0 | TS |
| | 04/12 | 13.5 | 146.2 | 990 | 45 | 3.0 | TS |
| | 04/18 | 13.7 | 145.6 | 990 | 45 | 3.0 | TS |
| | 05/00 | 13.8 | 145.2 | 990 | 45 | 3.0 | TS |
| | 05/06 | 14.5 | 144.9 | 990 | 45 | 3.0 | TS |
| | 05/12 | 15.1 | 144.2 | 990 | 45 | 3.0 | TS |
| | 05/18 | 15.9 | 143.4 | 985 | 50 | 3.5 | STS |
| | 06/00 | 16.5 | 142.6 | 980 | 55 | 3.5 | STS |
| | 06/06 | 17.2 | 141.4 | 980 | 55 | 3.5 | STS |
| | 06/12 | 17.4 | 140.2 | 980 | 55 | 3.5 | STS |
| | 06/18 | 17.5 | 138.8 | 975 | 60 | 4.0 | STS |
| | 07/00 | 17.7 | 137.6 | 970 | 65 | 4.0 | TY |
| | 07/06 | 18.1 | 136.4 | 965 | 70 | 4.5 | TY |
| | 07/12 | 18.5 | 135.5 | 965 | 70 | 4.5 | TY |
| | 07/18 | 19.1 | 134.4 | 965 | 70 | 4.5 | TY |
| | 08/00 | 19.6 | 133.5 | 965 | 70 | 4.5 | TY |
| | 08/06 | 20.4 | 132.6 | 965 | 70 | 4.5 | TY |
| | 08/12 | 21.0 | 131.7 | 965 | 70 | 4.5 | TY |
| | 08/18 | 21.7 | 130.6 | 965 | 70 | 4.5 | TY |
| | 09/00 | 22.5 | 129.6 | 965 | 70 | 4.5 | TY |
| | 09/03 | 23.0 | 129.2 | 965 | 70 | - | TY |
| | 09/06 | 23.3 | 128.7 | 960 | 75 | 5.0 | TY |
| | 09/09 | 23.8 | 128.2 | 955 | 80 | - | TY |
| | 09/12 | 24.2 | 127.6 | 945 | 85 | 5.5 | TY |
| | 09/15 | 24.6 | 127.1 | 940 | 85 | - | TY |
| | 09/18 | 25.1 | 126.5 | 935 | 90 | 6.0 | TY |
| | 09/21 | 25.5 | 125.9 | 935 | 90 | - | TY |
| | 10/00 | 25.7 | 125.5 | 935 | 90 | 6.0 | TY |
| | 10/03 | 26.1 | 125.1 | 935 | 90 | - | TY |
| | 10/06 | 26.5 | 124.7 | 935 | 90 | 6.0 | TY |
| | 10/09 | 26.9 | 124.3 | 935 | 90 | - | TY |
| | 10/12 | 27.3 | 124.0 | 940 | 85 | 6.0 | TY |
| | 10/18 | 27.8 | 123.3 | 945 | 85 | 5.5 | TY |
| | 11/00 | 28.7 | 122.9 | 950 | 80 | 5.5 | TY |
| | 11/06 | 29.5 | 122.5 | 960 | 75 | 5.5 | TY |
| | 11/12 | 30.3 | 122.9 | 965 | 70 | 5.0 | TY |
| | 11/18 | 31.8 | 123.2 | 970 | 60 | 4.5 | STS |
| | 12/00 | 33.3 | 123.6 | 975 | 55 | 4.0 | STS |
| | 12/06 | 34.9 | 124.2 | 980 | 50 | 3.5 | STS |
| | 12/12 | 36.5 | 124.7 | 985 | 45 | 3.0 | TS |
| | 12/18 | 38.2 | 125.4 | 985 | 40 | 2.5 | TS |
| | 13/00 | 40.0 | 126.0 | 986 | - | 2.5 | L |
| | 13/06 | | | | | | Dissip. |

## Linfa (1510)

| Date/Time (UTC) | | Center position Lat (N) | Center position Lon (E) | Central pressure (hPa) | Max wind (kt) | CI num. | Grade |
|---|---|---|---|---|---|---|---|
| Jul. | 01/18 | 13.4 | 129.8 | 1002 | - | 1.5 | TD |
| | 02/00 | 13.7 | 129.5 | 1002 | - | 1.5 | TD |
| | 02/06 | 14.2 | 129.0 | 1002 | - | 1.5 | TD |
| | 02/12 | 14.6 | 128.4 | 998 | 35 | 2.0 | TS |
| | 02/18 | 14.8 | 127.4 | 998 | 35 | 2.0 | TS |
| | 03/00 | 15.0 | 126.7 | 998 | 35 | 2.0 | TS |
| | 03/06 | 15.1 | 126.1 | 994 | 40 | 2.5 | TS |
| | 03/12 | 15.2 | 125.4 | 990 | 40 | 2.5 | TS |
| | 03/18 | 15.4 | 125.0 | 990 | 40 | 2.5 | TS |
| | 04/00 | 16.1 | 124.6 | 990 | 40 | 2.5 | TS |
| | 04/06 | 16.5 | 123.8 | 985 | 45 | 3.0 | TS |
| | 04/12 | 16.8 | 123.0 | 985 | 45 | 3.0 | TS |
| | 04/18 | 17.0 | 122.6 | 985 | 45 | 3.0 | TS |
| | 05/00 | 17.5 | 122.0 | 990 | 40 | 2.5 | TS |
| | 05/06 | 18.0 | 120.3 | 992 | 40 | 2.5 | TS |
| | 05/12 | 17.9 | 119.8 | 992 | 40 | 2.5 | TS |
| | 05/18 | 18.2 | 119.5 | 992 | 40 | 2.5 | TS |
| | 06/00 | 18.7 | 119.4 | 992 | 40 | 2.5 | TS |
| | 06/06 | 19.2 | 119.3 | 992 | 40 | 2.5 | TS |
| | 06/12 | 19.5 | 119.3 | 992 | 40 | 2.5 | TS |
| | 06/18 | 19.9 | 119.1 | 990 | 40 | 2.5 | TS |
| | 07/00 | 20.2 | 118.9 | 990 | 40 | 2.5 | TS |
| | 07/06 | 20.5 | 118.9 | 985 | 45 | 3.0 | TS |
| | 07/12 | 20.8 | 118.7 | 985 | 45 | 3.0 | TS |
| | 07/18 | 21.1 | 118.7 | 985 | 45 | 3.0 | TS |
| | 08/00 | 21.5 | 118.7 | 980 | 50 | 3.5 | STS |
| | 08/06 | 21.8 | 118.7 | 980 | 50 | 3.5 | STS |
| | 08/12 | 22.2 | 118.4 | 980 | 50 | 3.5 | STS |
| | 08/18 | 22.5 | 117.7 | 980 | 50 | 3.5 | STS |
| | 09/00 | 22.7 | 116.9 | 980 | 50 | 3.5 | STS |
| | 09/06 | 22.9 | 115.6 | 985 | 50 | 3.5 | STS |
| | 09/12 | 22.9 | 114.4 | 992 | 45 | 3.0 | TS |
| | 09/18 | 22.3 | 113.0 | 996 | 40 | 2.5 | TS |
| | 10/00 | 21.4 | 111.2 | 1000 | - | 2.0 | TD |
| | 10/06 | | | | | | Dissip. |

## Nangka (1511)

| Date/Time (UTC) | | Center position Lat (N) | Center position Lon (E) | Central pressure (hPa) | Max wind (kt) | CI num. | Grade |
|---|---|---|---|---|---|---|---|
| Jul. | 02/18 | 8.3 | 171.8 | 1004 | - | - | TD |
| | 03/00 | 8.5 | 171.7 | 1004 | - | 0.0 | TD |
| | 03/06 | 8.7 | 171.6 | 1002 | - | 0.5 | TD |
| | 03/12 | 9.0 | 171.5 | 1002 | - | 1.0 | TD |
| | 03/18 | 9.8 | 170.8 | 1000 | 35 | 1.5 | TS |
| | 04/00 | 10.3 | 170.3 | 998 | 35 | 1.5 | TS |
| | 04/06 | 10.9 | 168.8 | 996 | 40 | 1.5 | TS |
| | 04/12 | 11.2 | 167.1 | 994 | 40 | 2.0 | TS |
| | 04/18 | 11.1 | 165.9 | 992 | 45 | 2.5 | TS |
| | 05/00 | 11.3 | 164.7 | 992 | 45 | 2.5 | TS |
| | 05/06 | 11.2 | 163.8 | 990 | 45 | 2.5 | TS |
| | 05/12 | 11.0 | 162.5 | 985 | 50 | 3.0 | STS |
| | 05/18 | 11.5 | 161.0 | 980 | 55 | 3.0 | STS |
| | 06/00 | 11.7 | 159.9 | 975 | 60 | 3.5 | STS |
| | 06/06 | 11.7 | 158.6 | 970 | 60 | 4.0 | STS |
| | 06/12 | 12.2 | 157.8 | 965 | 65 | 4.5 | TY |
| | 06/18 | 12.6 | 156.8 | 955 | 75 | 5.0 | TY |
| | 07/00 | 13.1 | 155.6 | 945 | 85 | 5.0 | TY |
| | 07/06 | 13.7 | 154.5 | 935 | 90 | 6.0 | TY |
| | 07/12 | 14.3 | 153.5 | 925 | 100 | 6.0 | TY |
| | 07/18 | 15.0 | 152.2 | 925 | 100 | 6.0 | TY |
| | 08/00 | 15.4 | 150.7 | 930 | 95 | 6.0 | TY |
| | 08/06 | 15.4 | 149.9 | 935 | 90 | 6.0 | TY |
| | 08/12 | 16.0 | 149.0 | 935 | 90 | 6.0 | TY |
| | 08/18 | 16.6 | 147.8 | 930 | 95 | 6.5 | TY |
| | 09/00 | 17.0 | 146.8 | 930 | 95 | 6.5 | TY |
| | 09/06 | 17.6 | 145.9 | 925 | 100 | 6.5 | TY |
| | 09/12 | 18.0 | 144.5 | 925 | 100 | 6.5 | TY |
| | 09/18 | 18.2 | 143.6 | 925 | 100 | 6.5 | TY |
| | 10/00 | 18.2 | 142.7 | 925 | 100 | 6.5 | TY |
| | 10/06 | 18.4 | 142.0 | 930 | 95 | 6.0 | TY |
| | 10/12 | 18.2 | 141.3 | 935 | 90 | 5.5 | TY |
| | 10/18 | 18.3 | 140.7 | 940 | 85 | 5.5 | TY |
| | 11/00 | 18.3 | 140.0 | 940 | 85 | 5.5 | TY |
| | 11/06 | 18.3 | 139.5 | 945 | 85 | 5.0 | TY |
| | 11/12 | 18.4 | 139.0 | 950 | 80 | 5.0 | TY |
| | 11/18 | 18.4 | 138.4 | 950 | 80 | 5.0 | TY |
| | 12/00 | 18.4 | 137.8 | 955 | 75 | 5.0 | TY |
| | 12/06 | 18.6 | 137.6 | 955 | 75 | 5.0 | TY |
| | 12/12 | 18.7 | 137.5 | 960 | 70 | 4.5 | TY |
| | 12/18 | 19.0 | 137.2 | 960 | 70 | 4.5 | TY |
| | 13/00 | 19.6 | 137.2 | 960 | 70 | 4.5 | TY |
| | 13/06 | 20.5 | 137.1 | 955 | 75 | 4.5 | TY |
| | 13/12 | 21.3 | 136.9 | 950 | 80 | 4.5 | TY |
| | 13/18 | 22.2 | 136.6 | 950 | 80 | 5.0 | TY |
| | 14/00 | 22.7 | 136.5 | 950 | 80 | 5.0 | TY |
| | 14/06 | 23.7 | 136.6 | 950 | 80 | 5.0 | TY |
| | 14/12 | 24.4 | 136.6 | 950 | 80 | 5.0 | TY |
| | 14/18 | 25.5 | 136.5 | 945 | 85 | 5.5 | TY |
| | 15/00 | 26.5 | 136.3 | 945 | 85 | 5.5 | TY |
| | 15/06 | 27.6 | 136.0 | 945 | 85 | 5.5 | TY |
| | 15/12 | 29.0 | 135.6 | 945 | 85 | 5.5 | TY |
| | 15/18 | 30.0 | 135.3 | 950 | 80 | 5.0 | TY |
| | 16/00 | 31.0 | 134.7 | 955 | 75 | 5.0 | TY |
| | 16/03 | 31.4 | 134.6 | 955 | 75 | - | TY |
| | 16/06 | 32.0 | 134.6 | 960 | 70 | 4.5 | TY |
| | 16/09 | 32.5 | 134.5 | 960 | 70 | - | TY |
| | 16/12 | 33.0 | 134.3 | 960 | 70 | 4.5 | TY |
| | 16/14 | 33.4 | 134.1 | 965 | 65 | - | TY |
| | 16/15 | 33.6 | 134.0 | 970 | 65 | - | TY |
| | 16/18 | 34.1 | 133.7 | 975 | 60 | 4.5 | STS |
| | 16/21 | 34.5 | 133.6 | 985 | 55 | - | STS |
| | 17/00 | 35.0 | 133.4 | 990 | 50 | 4.0 | STS |
| | 17/03 | 35.3 | 133.4 | 992 | 45 | - | TS |
| | 17/06 | 35.7 | 133.6 | 994 | 35 | 3.5 | TS |
| | 17/12 | 36.8 | 134.3 | 998 | - | 3.0 | TD |
| | 17/18 | 38.0 | 135.2 | 1002 | - | 2.5 | TD |
| | 18/00 | 39.0 | 136.0 | 1004 | - | - | TD |
| | 18/06 | 40.0 | 136.5 | 1004 | - | - | TD |
| | 18/12 | | | | | | Dissip. |

## Halola (1512)

| Date/Time (UTC) | | Center position Lat (N) | Center position Lon (E) | Central pressure (hPa) | Max wind (kt) | CI num. | Grade |
|---|---|---|---|---|---|---|---|
| Jul. | 12/18 | 12.6 | 180.7 | 990 | 50 | 2.5 | Out |
| | 13/00 | 13.0 | 179.8 | 990 | 50 | 3.0 | STS |
| | 13/06 | 13.6 | 178.8 | 985 | 55 | 3.5 | STS |
| | 13/12 | 14.1 | 177.5 | 980 | 60 | 4.0 | STS |
| | 13/18 | 14.6 | 176.4 | 980 | 60 | 4.0 | STS |
| | 14/00 | 15.2 | 175.5 | 975 | 65 | 4.5 | TY |
| | 14/06 | 15.7 | 174.4 | 970 | 70 | 5.0 | TY |
| | 14/12 | 16.3 | 173.2 | 970 | 70 | 5.0 | TY |
| | 14/18 | 16.6 | 172.0 | 975 | 65 | 5.0 | TY |
| | 15/00 | 17.0 | 171.6 | 975 | 65 | 5.0 | TY |
| | 15/06 | 17.4 | 170.6 | 980 | 60 | 4.5 | STS |
| | 15/12 | 18.0 | 169.4 | 980 | 60 | 4.5 | STS |
| | 15/18 | 18.4 | 167.9 | 980 | 60 | 4.5 | STS |
| | 16/00 | 18.5 | 166.8 | 985 | 55 | 4.0 | STS |
| | 16/06 | 18.6 | 165.7 | 990 | 50 | 3.5 | STS |
| | 16/12 | 18.5 | 164.2 | 996 | 40 | 3.0 | TS |
| | 16/18 | 18.4 | 162.5 | 1000 | 35 | 2.5 | TS |
| | 17/00 | 18.2 | 161.3 | 1004 | - | 2.5 | TD |
| | 17/06 | 18.0 | 160.3 | 1004 | - | 2.5 | TD |
| | 17/12 | 17.9 | 159.4 | 1004 | - | 2.5 | TD |
| | 17/18 | 17.7 | 158.5 | 1004 | - | 2.5 | TD |
| | 18/00 | 17.6 | 157.3 | 1004 | - | 2.5 | TD |
| | 18/06 | 17.7 | 155.9 | 1006 | - | 2.5 | TD |
| | 18/12 | 17.8 | 154.8 | 1008 | - | 2.5 | TD |
| | 18/18 | 18.2 | 153.6 | 1008 | - | 2.5 | TD |
| | 19/00 | 18.9 | 152.7 | 1008 | - | 2.5 | TD |
| | 19/06 | 19.6 | 151.8 | 1006 | - | 2.5 | TD |
| | 19/12 | 20.0 | 150.5 | 1004 | - | 2.0 | TD |
| | 19/18 | 20.4 | 149.5 | 1000 | 35 | 2.0 | TS |
| | 20/00 | 21.0 | 148.5 | 996 | 40 | 2.5 | TS |
| | 20/06 | 21.5 | 147.4 | 990 | 50 | 3.0 | STS |
| | 20/12 | 21.7 | 146.4 | 990 | 50 | 3.0 | STS |
| | 20/18 | 22.0 | 145.4 | 985 | 55 | 3.5 | STS |
| | 21/00 | 22.4 | 144.1 | 975 | 65 | 4.0 | TY |
| | 21/06 | 22.6 | 142.9 | 970 | 70 | 4.5 | TY |
| | 21/12 | 22.9 | 141.7 | 965 | 75 | 4.5 | TY |
| | 21/18 | 23.0 | 140.5 | 955 | 80 | 5.0 | TY |
| | 22/00 | 23.3 | 139.6 | 955 | 80 | 5.0 | TY |
| | 22/06 | 23.6 | 138.5 | 955 | 80 | 5.0 | TY |
| | 22/12 | 23.8 | 137.7 | 955 | 80 | 5.0 | TY |
| | 22/18 | 24.2 | 136.8 | 955 | 80 | 5.0 | TY |
| | 23/00 | 24.4 | 136.0 | 965 | 75 | 4.5 | TY |
| | 23/06 | 24.6 | 135.1 | 965 | 75 | 4.5 | TY |
| | 23/12 | 24.5 | 134.3 | 965 | 75 | 4.5 | TY |
| | 23/18 | 24.6 | 133.4 | 965 | 75 | 4.5 | TY |
| | 23/21 | 24.6 | 133.1 | 965 | 75 | - | TY |
| | 24/00 | 24.9 | 132.7 | 965 | 75 | 4.5 | TY |
| | 24/03 | 24.8 | 132.1 | 965 | 75 | - | TY |
| | 24/06 | 24.8 | 131.8 | 965 | 75 | 4.5 | TY |
| | 24/09 | 24.9 | 131.3 | 965 | 75 | - | TY |
| | 24/12 | 25.0 | 131.1 | 970 | 70 | 4.0 | TY |
| | 24/15 | 25.2 | 130.8 | 970 | 70 | - | TY |
| | 24/18 | 25.5 | 130.6 | 975 | 65 | 3.5 | TY |
| | 24/21 | 25.8 | 130.2 | 975 | 65 | - | TY |
| | 25/00 | 26.2 | 129.9 | 975 | 65 | 3.5 | TY |
| | 25/03 | 26.8 | 129.8 | 975 | 65 | - | TY |
| | 25/06 | 27.4 | 129.6 | 975 | 65 | 3.5 | TY |
| | 25/09 | 27.8 | 129.3 | 975 | 65 | - | TY |
| | 25/12 | 28.3 | 129.2 | 980 | 60 | 3.0 | STS |
| | 25/15 | 28.8 | 129.1 | 980 | 60 | - | STS |
| | 25/18 | 29.4 | 129.1 | 980 | 60 | 2.5 | STS |
| | 25/21 | 30.1 | 129.2 | 985 | 55 | - | STS |
| | 26/00 | 31.0 | 129.3 | 990 | 50 | 2.5 | STS |
| | 26/03 | 31.7 | 129.3 | 990 | 50 | - | STS |
| | 26/06 | 32.4 | 129.5 | 994 | 45 | 2.5 | TS |
| | 26/09 | 33.0 | 129.7 | 996 | 40 | - | TS |
| | 26/10 | 33.1 | 129.8 | 998 | 40 | - | TS |
| | 26/12 | 33.8 | 130.0 | 1004 | - | 2.0 | TD |
| | 26/18 | | | | | | Dissip. |

## Soudelor (1513)

| Date/Time (UTC) | | Center position Lat (N) | Lon (E) | Central pressure (hPa) | Max wind (kt) | CI num. | Grade |
|---|---|---|---|---|---|---|---|
| Jul. | 29/18 | 13.3 | 162.2 | 1006 | - | 0.5 | TD |
| | 30/00 | 13.7 | 160.7 | 1004 | - | 1.0 | TD |
| | 30/06 | 13.6 | 159.8 | 1004 | - | 1.5 | TD |
| | 30/12 | 13.6 | 159.3 | 1004 | - | 1.5 | TD |
| | 30/18 | 13.5 | 158.8 | 1002 | - | 1.5 | TD |
| | 31/00 | 13.4 | 158.2 | 1002 | - | 2.0 | TD |
| | 31/06 | 13.2 | 156.8 | 1002 | - | 2.0 | TD |
| | 31/12 | 13.4 | 155.5 | 1002 | - | 2.0 | TD |
| | 31/18 | 13.4 | 154.4 | 1000 | - | 2.0 | TD |
| Aug. | 01/00 | 13.6 | 153.4 | 1000 | - | 2.0 | TD |
| | 01/06 | 14.0 | 152.1 | 998 | 35 | 2.0 | TS |
| | 01/12 | 14.3 | 150.7 | 996 | 40 | 2.5 | TS |
| | 01/18 | 14.4 | 149.6 | 990 | 50 | 3.0 | STS |
| | 02/00 | 14.6 | 148.2 | 980 | 60 | 4.0 | STS |
| | 02/06 | 14.9 | 146.8 | 970 | 70 | 4.5 | TY |
| | 02/12 | 15.1 | 146.0 | 960 | 80 | 5.0 | TY |
| | 02/18 | 15.6 | 145.0 | 945 | 85 | 5.5 | TY |
| | 03/00 | 16.2 | 144.0 | 940 | 90 | 5.5 | TY |
| | 03/06 | 16.9 | 143.0 | 930 | 95 | 6.0 | TY |
| | 03/12 | 17.4 | 141.9 | 910 | 105 | 7.0 | TY |
| | 03/18 | 17.9 | 140.7 | 900 | 115 | 7.5 | TY |
| | 04/00 | 18.3 | 139.6 | 900 | 115 | 7.5 | TY |
| | 04/06 | 18.6 | 138.3 | 900 | 115 | 7.5 | TY |
| | 04/12 | 18.9 | 137.2 | 910 | 105 | 7.0 | TY |
| | 04/18 | 19.3 | 136.2 | 925 | 100 | 6.5 | TY |
| | 05/00 | 19.5 | 134.9 | 930 | 95 | 6.0 | TY |
| | 05/06 | 19.9 | 133.7 | 930 | 95 | 6.0 | TY |
| | 05/12 | 20.0 | 132.6 | 935 | 90 | 6.0 | TY |
| | 05/18 | 20.1 | 131.5 | 935 | 90 | 6.0 | TY |
| | 06/00 | 20.5 | 130.2 | 935 | 90 | 6.0 | TY |
| | 06/06 | 20.9 | 129.2 | 935 | 90 | 6.0 | TY |
| | 06/12 | 21.2 | 128.2 | 935 | 90 | 5.5 | TY |
| | 06/18 | 21.5 | 126.8 | 935 | 90 | 5.5 | TY |
| | 07/00 | 21.9 | 125.8 | 935 | 90 | 5.5 | TY |
| | 07/03 | 22.1 | 125.3 | 935 | 90 | - | TY |
| | 07/06 | 22.4 | 124.8 | 935 | 90 | 5.5 | TY |
| | 07/09 | 22.7 | 124.3 | 935 | 90 | - | TY |
| | 07/12 | 22.9 | 123.8 | 935 | 90 | 5.5 | TY |
| | 07/15 | 23.2 | 123.3 | 935 | 90 | - | TY |
| | 07/18 | 23.7 | 122.7 | 935 | 90 | 5.5 | TY |
| | 07/21 | 24.1 | 121.5 | 950 | 80 | - | TY |
| | 08/00 | 23.9 | 121.0 | 965 | 70 | 5.5 | TY |
| | 08/03 | 23.9 | 120.5 | 970 | 70 | - | TY |
| | 08/06 | 24.1 | 120.0 | 970 | 70 | 4.5 | TY |
| | 08/12 | 24.6 | 119.2 | 975 | 65 | 4.5 | TY |
| | 08/18 | 25.2 | 118.3 | 980 | 55 | 4.0 | STS |
| | 09/00 | 25.8 | 117.6 | 992 | 40 | 3.5 | TS |
| | 09/06 | 26.6 | 116.9 | 994 | 35 | 3.0 | TS |
| | 09/12 | 27.8 | 116.4 | 996 | - | 2.5 | TD |
| | 09/18 | 29.1 | 116.8 | 998 | - | - | TD |
| | 10/00 | 30.2 | 117.5 | 1000 | - | - | TD |
| | 10/06 | 31.1 | 118.2 | 1000 | - | - | TD |
| | 10/12 | 31.9 | 119.6 | 1000 | - | - | TD |
| | 10/18 | 32.4 | 120.5 | 1000 | - | - | TD |
| | 11/00 | 32.7 | 121.4 | 998 | 35 | - | TS |
| | 11/06 | 33.0 | 122.4 | 998 | 35 | - | TS |
| | 11/12 | 33.0 | 123.3 | 1000 | - | - | TD |
| | 11/18 | 33.0 | 125.0 | 1000 | - | - | L |
| | 12/00 | 33.3 | 126.7 | 1000 | - | - | L |
| | 12/06 | | | | | | Dissip. |

## Molave (1514)

| Date/Time (UTC) | | Center position Lat (N) | Lon (E) | Central pressure (hPa) | Max wind (kt) | CI num. | Grade |
|---|---|---|---|---|---|---|---|
| Aug. | 06/00 | 17.6 | 149.3 | 1004 | - | 0.5 | TD |
| | 06/06 | 18.6 | 148.9 | 1002 | - | 1.0 | TD |
| | 06/12 | 19.5 | 148.7 | 1002 | - | 1.0 | TD |
| | 06/18 | 20.6 | 148.2 | 1002 | - | 1.0 | TD |
| | 07/00 | 21.4 | 147.8 | 1002 | - | 1.5 | TD |
| | 07/06 | 22.6 | 147.2 | 1000 | 35 | 2.0 | TS |
| | 07/12 | 23.9 | 146.3 | 1000 | 35 | 2.0 | TS |
| | 07/18 | 25.1 | 145.5 | 998 | 35 | 2.0 | TS |
| | 08/00 | 26.1 | 144.2 | 994 | 35 | 2.0 | TS |
| | 08/06 | 26.4 | 143.2 | 990 | 40 | 2.5 | TS |
| | 08/12 | 26.5 | 142.2 | 990 | 40 | 2.5 | TS |
| | 08/18 | 26.8 | 141.6 | 990 | 40 | 2.5 | TS |
| | 09/00 | 27.2 | 140.9 | 990 | 40 | 2.5 | TS |
| | 09/06 | 27.8 | 140.8 | 990 | 40 | 2.5 | TS |
| | 09/12 | 28.4 | 140.7 | 990 | 40 | 2.5 | TS |
| | 09/18 | 29.1 | 140.5 | 990 | 40 | 2.5 | TS |
| | 10/00 | 29.9 | 140.4 | 990 | 40 | 2.5 | TS |
| | 10/06 | 30.4 | 140.6 | 990 | 40 | 2.5 | TS |
| | 10/12 | 30.8 | 141.2 | 990 | 40 | 2.5 | TS |
| | 10/18 | 31.1 | 141.8 | 985 | 45 | 3.0 | TS |
| | 11/00 | 31.5 | 142.7 | 985 | 45 | 3.0 | TS |
| | 11/06 | 32.0 | 143.5 | 985 | 45 | 3.0 | TS |
| | 11/12 | 32.5 | 144.8 | 985 | 45 | 3.0 | TS |
| | 11/18 | 32.9 | 146.1 | 990 | 40 | 2.5 | TS |
| | 12/00 | 33.4 | 147.3 | 990 | 40 | 2.5 | TS |
| | 12/06 | 33.6 | 148.5 | 990 | 40 | 2.5 | TS |
| | 12/12 | 33.8 | 150.2 | 990 | 40 | 2.5 | TS |
| | 12/18 | 34.0 | 151.7 | 990 | 40 | 2.5 | TS |
| | 13/00 | 35.0 | 153.4 | 990 | 40 | 2.5 | TS |
| | 13/06 | 35.9 | 155.3 | 990 | 40 | 2.5 | TS |
| | 13/12 | 36.5 | 157.0 | 990 | 40 | 2.0 | TS |
| | 13/18 | 37.1 | 159.1 | 990 | 40 | 2.0 | TS |
| | 14/00 | 37.2 | 161.6 | 992 | - | 1.5 | L |
| | 14/06 | 38.3 | 165.3 | 990 | - | - | L |
| | 14/12 | 39.1 | 167.5 | 988 | - | - | L |
| | 14/18 | 39.4 | 169.4 | 986 | - | - | L |
| | 15/00 | 40.0 | 170.5 | 988 | - | - | L |
| | 15/06 | 40.6 | 171.4 | 990 | - | - | L |
| | 15/12 | 40.8 | 171.1 | 990 | - | - | L |
| | 15/18 | 40.2 | 170.9 | 992 | - | - | L |
| | 16/00 | 39.4 | 171.4 | 996 | - | - | L |
| | 16/06 | 38.7 | 172.4 | 996 | - | - | L |
| | 16/12 | 38.5 | 174.2 | 1000 | - | - | L |
| | 16/18 | 38.3 | 175.5 | 1000 | - | - | L |
| | 17/00 | 38.1 | 176.8 | 1002 | - | - | L |
| | 17/06 | 38.6 | 177.8 | 1004 | - | - | L |
| | 17/12 | 39.2 | 178.4 | 1006 | - | - | L |
| | 17/18 | 39.5 | 179.9 | 1006 | - | - | L |
| | 18/00 | 40.1 | 180.5 | 1008 | - | - | Out |

## Goni (1515)

| Date/Time (UTC) | | Center position Lat (N) | Lon (E) | Central pressure (hPa) | Max wind (kt) | CI num. | Grade |
|---|---|---|---|---|---|---|---|
| Aug. | 13/18 | 12.2 | 151.1 | 1006 | - | 1.0 | TD |
| | 14/00 | 12.3 | 150.4 | 1004 | - | 2.0 | TD |
| | 14/06 | 12.4 | 149.9 | 1002 | - | 2.0 | TD |
| | 14/12 | 12.7 | 149.1 | 1002 | - | 2.5 | TD |
| | 14/18 | 13.0 | 148.2 | 1000 | 35 | 2.5 | TS |
| | 15/00 | 13.5 | 147.0 | 994 | 45 | 3.0 | TS |
| | 15/06 | 13.8 | 146.4 | 992 | 45 | 3.0 | TS |
| | 15/12 | 14.2 | 146.0 | 990 | 50 | 3.0 | STS |
| | 15/18 | 14.4 | 145.4 | 985 | 55 | 3.5 | STS |
| | 16/00 | 14.7 | 144.8 | 980 | 60 | 3.5 | STS |
| | 16/06 | 15.0 | 144.2 | 980 | 60 | 3.5 | STS |
| | 16/12 | 15.5 | 143.6 | 970 | 65 | 4.0 | TY |
| | 16/18 | 16.0 | 142.7 | 960 | 75 | 5.0 | TY |
| | 17/00 | 16.5 | 141.7 | 950 | 85 | 5.5 | TY |
| | 17/06 | 17.0 | 140.5 | 935 | 95 | 6.0 | TY |
| | 17/12 | 17.3 | 139.2 | 935 | 95 | 6.0 | TY |
| | 17/18 | 17.7 | 137.8 | 935 | 95 | 6.0 | TY |
| | 18/00 | 18.2 | 136.0 | 935 | 95 | 6.0 | TY |
| | 18/06 | 18.6 | 134.6 | 935 | 95 | 6.0 | TY |
| | 18/12 | 18.7 | 132.9 | 935 | 95 | 6.0 | TY |
| | 18/18 | 18.8 | 131.2 | 945 | 85 | 5.5 | TY |
| | 19/00 | 18.9 | 129.9 | 945 | 85 | 5.5 | TY |
| | 19/06 | 19.0 | 128.4 | 945 | 85 | 5.5 | TY |
| | 19/12 | 18.9 | 127.3 | 940 | 90 | 5.5 | TY |
| | 19/18 | 18.9 | 126.1 | 940 | 90 | 5.5 | TY |
| | 20/00 | 18.8 | 125.3 | 940 | 90 | 5.5 | TY |
| | 20/06 | 18.9 | 124.7 | 945 | 85 | 5.5 | TY |
| | 20/12 | 19.0 | 124.0 | 945 | 85 | 5.0 | TY |
| | 20/18 | 19.1 | 123.2 | 945 | 85 | 5.5 | TY |
| | 21/00 | 19.2 | 122.9 | 945 | 85 | 5.5 | TY |
| | 21/06 | 19.3 | 122.4 | 945 | 85 | 5.5 | TY |
| | 21/12 | 19.3 | 122.3 | 955 | 80 | 5.0 | TY |
| | 21/18 | 19.6 | 122.5 | 955 | 80 | 5.0 | TY |
| | 22/00 | 20.1 | 122.6 | 955 | 80 | 5.0 | TY |
| | 22/06 | 20.7 | 122.7 | 955 | 80 | 5.0 | TY |
| | 22/12 | 21.3 | 123.1 | 955 | 80 | 5.0 | TY |
| | 22/15 | 21.9 | 123.2 | 955 | 80 | - | TY |
| | 22/18 | 22.4 | 123.2 | 955 | 80 | 5.0 | TY |
| | 22/21 | 22.8 | 123.3 | 955 | 80 | - | TY |
| | 23/00 | 23.1 | 123.3 | 955 | 80 | 5.0 | TY |
| | 23/03 | 23.5 | 123.4 | 955 | 80 | - | TY |
| | 23/06 | 23.8 | 123.5 | 950 | 85 | 5.5 | TY |
| | 23/09 | 24.2 | 123.8 | 940 | 90 | - | TY |
| | 23/10 | 24.3 | 123.9 | 940 | 90 | - | TY |
| | 23/12 | 24.5 | 124.0 | 935 | 95 | 6.0 | TY |
| | 23/15 | 24.8 | 124.2 | 935 | 95 | - | TY |
| | 23/18 | 25.2 | 124.6 | 930 | 100 | 6.5 | TY |
| | 23/21 | 25.7 | 125.3 | 930 | 100 | - | TY |
| | 24/00 | 26.2 | 125.9 | 930 | 100 | 6.5 | TY |
| | 24/03 | 27.1 | 126.7 | 930 | 100 | - | TY |
| | 24/06 | 27.9 | 127.4 | 930 | 100 | 6.5 | TY |
| | 24/09 | 28.8 | 128.1 | 930 | 100 | - | TY |
| | 24/12 | 29.6 | 128.8 | 940 | 90 | 5.5 | TY |
| | 24/15 | 30.5 | 129.5 | 940 | 90 | - | TY |
| | 24/18 | 31.7 | 129.9 | 940 | 90 | 6.0 | TY |
| | 24/19 | 32.0 | 130.1 | 945 | 85 | - | TY |
| | 24/20 | 32.4 | 130.5 | 950 | 85 | - | TY |
| | 24/21 | 32.8 | 130.5 | 955 | 80 | - | TY |
| | 25/00 | 33.8 | 130.4 | 965 | 70 | 5.0 | TY |
| | 25/03 | 34.6 | 130.6 | 965 | 70 | - | TY |
| | 25/06 | 35.3 | 131.0 | 965 | 70 | 4.5 | TY |
| | 25/09 | 36.0 | 131.8 | 970 | 60 | - | STS |
| | 25/12 | 36.5 | 132.3 | 980 | - | - | L |
| | 25/18 | 37.7 | 133.0 | 980 | - | - | L |
| | 26/00 | 39.3 | 133.5 | 984 | - | - | L |
| | 26/06 | 40.5 | 134.1 | 984 | - | - | L |
| | 26/12 | 41.3 | 133.9 | 988 | - | - | L |
| | 26/18 | 43.0 | 133.0 | 990 | - | - | L |
| | 27/00 | 44.4 | 131.8 | 998 | - | - | L |
| | 27/06 | 44.5 | 128.6 | 1000 | - | - | L |
| | 27/12 | 44.2 | 127.3 | 1002 | - | - | L |
| | 27/18 | 43.9 | 126.7 | 1002 | - | - | L |
| | 28/00 | 44.0 | 126.4 | 1004 | - | - | L |
| | 28/06 | 44.1 | 126.3 | 1002 | - | - | L |
| | 28/12 | 44.3 | 126.4 | 1004 | - | - | L |
| | 28/18 | 44.5 | 126.4 | 1006 | - | - | L |
| | 29/00 | 44.6 | 126.4 | 1006 | - | - | L |
| | 29/06 | 44.9 | 126.4 | 1006 | - | - | L |
| | 29/12 | 45.2 | 126.1 | 1008 | - | - | L |
| | 29/18 | 45.5 | 125.8 | 1008 | - | - | L |
| | 30/00 | 45.5 | 125.8 | 1010 | - | - | L |
| | 30/06 | 45.5 | 125.8 | 1010 | - | - | L |
| | 30/12 | | | | | | Dissip. |

## Atsani (1516)

| Date/Time (UTC) | | Center position Lat (N) | Lon (E) | Central pressure (hPa) | Max wind (kt) | CI num. | Grade |
|---|---|---|---|---|---|---|---|
| Aug. | 14/00 | 14.8 | 163.5 | 1004 | - | 0.5 | TD |
| | 14/06 | 15.0 | 163.0 | 1004 | - | 0.5 | TD |
| | 14/12 | 15.0 | 162.6 | 1004 | - | 1.0 | TD |
| | 14/18 | 14.8 | 162.4 | 1002 | 35 | 1.5 | TS |
| | 15/00 | 14.7 | 162.2 | 1002 | 35 | 2.0 | TS |
| | 15/06 | 14.8 | 162.0 | 1000 | 35 | 2.0 | TS |
| | 15/12 | 14.9 | 161.8 | 998 | 40 | 2.5 | TS |
| | 15/18 | 14.8 | 161.3 | 994 | 45 | 3.0 | TS |
| | 16/00 | 14.4 | 160.9 | 990 | 45 | 3.0 | TS |
| | 16/06 | 14.5 | 160.4 | 985 | 50 | 3.5 | STS |
| | 16/12 | 14.4 | 160.0 | 980 | 55 | 4.0 | STS |
| | 16/18 | 14.3 | 159.6 | 975 | 60 | 4.0 | STS |
| | 17/00 | 14.5 | 159.1 | 970 | 65 | 4.5 | TY |
| | 17/06 | 14.7 | 158.5 | 960 | 75 | 5.0 | TY |
| | 17/12 | 15.1 | 158.0 | 950 | 80 | 6.0 | TY |
| | 17/18 | 15.7 | 157.0 | 940 | 90 | 6.0 | TY |
| | 18/00 | 15.9 | 156.2 | 935 | 95 | 6.0 | TY |
| | 18/06 | 16.3 | 155.5 | 935 | 95 | 6.0 | TY |
| | 18/12 | 17.0 | 154.9 | 930 | 95 | 6.0 | TY |
| | 18/18 | 17.9 | 153.8 | 930 | 95 | 6.5 | TY |
| | 19/00 | 18.7 | 152.9 | 925 | 100 | 6.5 | TY |
| | 19/06 | 19.1 | 151.9 | 925 | 100 | 6.5 | TY |
| | 19/12 | 19.7 | 151.3 | 925 | 100 | 6.5 | TY |
| | 19/18 | 20.4 | 150.4 | 925 | 100 | 6.5 | TY |
| | 20/00 | 21.2 | 149.5 | 925 | 100 | 6.0 | TY |
| | 20/06 | 22.0 | 148.6 | 930 | 95 | 6.0 | TY |
| | 20/12 | 22.6 | 147.8 | 930 | 95 | 5.5 | TY |
| | 20/18 | 23.3 | 147.1 | 935 | 90 | 5.5 | TY |
| | 21/00 | 24.1 | 146.5 | 940 | 90 | 5.5 | TY |
| | 21/06 | 25.0 | 146.0 | 945 | 85 | 5.5 | TY |
| | 21/12 | 25.5 | 145.5 | 945 | 85 | 5.5 | TY |
| | 21/18 | 26.4 | 145.1 | 950 | 80 | 5.5 | TY |
| | 22/00 | 27.0 | 144.9 | 950 | 80 | 5.5 | TY |
| | 22/06 | 27.6 | 145.0 | 950 | 80 | 5.5 | TY |
| | 22/12 | 28.2 | 145.1 | 950 | 80 | 5.5 | TY |
| | 22/18 | 29.0 | 145.3 | 950 | 80 | 5.0 | TY |
| | 23/00 | 29.5 | 145.5 | 950 | 80 | 5.0 | TY |
| | 23/06 | 30.0 | 146.1 | 950 | 80 | 5.0 | TY |
| | 23/12 | 30.6 | 146.7 | 955 | 75 | 5.0 | TY |
| | 23/18 | 31.3 | 147.4 | 955 | 75 | 4.5 | TY |
| | 24/00 | 32.0 | 148.1 | 955 | 75 | 4.5 | TY |
| | 24/06 | 32.6 | 149.2 | 960 | 70 | 4.0 | TY |
| | 24/12 | 32.9 | 150.8 | 965 | 65 | 4.0 | TY |
| | 24/18 | 33.9 | 152.9 | 965 | 60 | 3.5 | STS |
| | 25/00 | 35.6 | 155.7 | 965 | 60 | 3.0 | STS |
| | 25/06 | 37.6 | 158.0 | 964 | - | 2.5 | L |
| | 25/12 | 39.0 | 159.3 | 958 | - | - | L |
| | 25/18 | 39.4 | 161.1 | 960 | - | - | L |
| | 26/00 | 39.5 | 162.4 | 964 | - | - | L |
| | 26/06 | 40.0 | 163.6 | 968 | - | - | L |
| | 26/12 | 40.5 | 164.1 | 970 | - | - | L |
| | 26/18 | 40.6 | 164.1 | 972 | - | - | L |
| | 27/00 | 40.5 | 164.0 | 976 | - | - | L |
| | 27/06 | 40.4 | 164.1 | 978 | - | - | L |
| | 27/12 | 40.3 | 164.3 | 980 | - | - | L |
| | 27/18 | 40.1 | 164.6 | 980 | - | - | L |
| | 28/00 | 40.2 | 164.8 | 984 | - | - | L |
| | 28/06 | 40.8 | 165.3 | 988 | - | - | L |
| | 28/12 | 41.9 | 165.9 | 990 | - | - | L |
| | 28/18 | 43.5 | 166.5 | 992 | - | - | L |
| | 29/00 | 45.4 | 167.6 | 996 | - | - | L |
| | 29/06 | 47.7 | 168.7 | 996 | - | - | L |
| | 29/12 | | | | | | Dissip. |

## Kilo (1517)

| Date/Time (UTC) | | Center position Lat (N) | Lon (E) | Central pressure (hPa) | Max wind (kt) | CI num. | Grade |
|---|---|---|---|---|---|---|---|
| Sep. | 01/18 | 23.7 | 180.1 | 945 | 90 | 5.0 | Out |
| | 02/00 | 24.0 | 179.8 | 950 | 80 | 5.0 | TY |
| | 02/06 | 24.4 | 179.4 | 950 | 80 | 5.0 | TY |
| | 02/12 | 24.6 | 179.1 | 965 | 70 | 4.5 | TY |
| | 02/18 | 24.6 | 178.5 | 965 | 70 | 4.5 | TY |
| | 03/00 | 24.7 | 178.2 | 965 | 70 | 4.5 | TY |
| | 03/06 | 24.6 | 178.1 | 965 | 70 | 4.5 | TY |
| | 03/12 | 24.4 | 177.7 | 965 | 70 | 4.5 | TY |
| | 03/18 | 24.1 | 177.5 | 965 | 70 | 4.5 | TY |
| | 04/00 | 23.8 | 177.1 | 970 | 65 | 4.5 | TY |
| | 04/06 | 23.6 | 176.6 | 970 | 65 | 4.5 | TY |
| | 04/12 | 23.5 | 175.8 | 970 | 65 | 4.5 | TY |
| | 04/18 | 23.5 | 174.9 | 970 | 65 | 4.5 | TY |
| | 05/00 | 23.5 | 174.0 | 970 | 65 | 4.5 | TY |
| | 05/06 | 23.6 | 173.0 | 955 | 75 | 5.0 | TY |
| | 05/12 | 23.5 | 172.1 | 955 | 75 | 5.0 | TY |
| | 05/18 | 23.7 | 170.7 | 950 | 80 | 5.0 | TY |
| | 06/00 | 23.9 | 169.7 | 950 | 80 | 5.0 | TY |
| | 06/06 | 24.0 | 168.9 | 950 | 80 | 5.0 | TY |
| | 06/12 | 24.3 | 167.6 | 955 | 75 | 4.5 | TY |
| | 06/18 | 24.4 | 166.5 | 955 | 75 | 4.5 | TY |
| | 07/00 | 24.7 | 165.6 | 955 | 75 | 4.5 | TY |
| | 07/06 | 25.0 | 164.2 | 955 | 75 | 4.5 | TY |
| | 07/12 | 25.2 | 163.3 | 965 | 70 | 4.5 | TY |
| | 07/18 | 25.6 | 162.1 | 965 | 70 | 4.5 | TY |
| | 08/00 | 26.1 | 160.3 | 965 | 70 | 4.5 | TY |
| | 08/06 | 26.7 | 158.7 | 965 | 70 | 4.5 | TY |
| | 08/12 | 27.2 | 157.3 | 965 | 70 | 4.5 | TY |
| | 08/18 | 28.1 | 156.0 | 970 | 65 | 4.0 | TY |
| | 09/00 | 29.1 | 154.7 | 970 | 65 | 4.0 | TY |
| | 09/06 | 29.7 | 153.2 | 970 | 65 | 4.0 | TY |
| | 09/12 | 30.7 | 152.5 | 975 | 60 | 3.5 | STS |
| | 09/18 | 31.6 | 151.2 | 975 | 60 | 3.0 | STS |
| | 10/00 | 32.6 | 150.0 | 975 | 60 | 2.5 | STS |
| | 10/06 | 34.0 | 149.6 | 975 | 60 | 2.5 | STS |
| | 10/12 | 35.3 | 149.0 | 975 | 60 | 2.5 | STS |
| | 10/18 | 36.9 | 148.6 | 975 | 60 | 2.5 | STS |
| | 11/00 | 38.7 | 147.4 | 975 | 60 | 2.5 | STS |
| | 11/06 | 40.6 | 147.2 | 975 | 60 | 2.5 | STS |
| | 11/12 | 43.0 | 148.0 | 980 | - | 2.0 | L |
| | 11/18 | 45.8 | 148.6 | 984 | - | - | L |
| | 12/00 | 48.8 | 149.8 | 988 | - | - | L |
| | 12/06 | 53.2 | 151.7 | 988 | - | - | L |
| | 12/12 | 55.4 | 153.7 | 992 | - | - | L |
| | 12/18 | 58.3 | 156.0 | 992 | - | - | L |
| | 13/00 | 60.5 | 159.4 | 992 | - | - | Out |

## Etau (1518)

| Date/Time (UTC) | | Center position Lat (N) | Lon (E) | Central pressure (hPa) | Max wind (kt) | CI num. | Grade |
|---|---|---|---|---|---|---|---|
| Sep. | 06/00 | 19.8 | 139.7 | 1004 | - | 1.0 | TD |
| | 06/06 | 20.4 | 139.4 | 1002 | - | 1.0 | TD |
| | 06/12 | 21.2 | 139.2 | 1002 | - | 1.5 | TD |
| | 06/18 | 22.1 | 139.0 | 1002 | - | 1.5 | TD |
| | 07/00 | 23.1 | 138.8 | 1002 | - | 2.0 | TD |
| | 07/06 | 24.1 | 138.6 | 1000 | - | 2.0 | TD |
| | 07/12 | 25.1 | 138.4 | 998 | 35 | 2.5 | TS |
| | 07/18 | 26.3 | 138.3 | 996 | 40 | 2.5 | TS |
| | 08/00 | 27.7 | 138.3 | 990 | 45 | 3.0 | TS |
| | 08/06 | 29.3 | 138.3 | 985 | 50 | 3.0 | STS |
| | 08/12 | 31.0 | 138.3 | 985 | 50 | 3.0 | STS |
| | 08/15 | 32.2 | 138.0 | 985 | 50 | - | STS |
| | 08/18 | 33.1 | 137.6 | 985 | 50 | 3.0 | STS |
| | 08/21 | 33.8 | 137.3 | 990 | 45 | - | TS |
| | 09/00 | 34.5 | 137.1 | 990 | 45 | 2.5 | TS |
| | 09/03 | 35.9 | 136.7 | 996 | 35 | - | TS |
| | 09/06 | 37.2 | 136.3 | 998 | - | 2.0 | L |
| | 09/12 | 38.0 | 135.0 | 998 | - | 1.5 | L |
| | 09/18 | 39.0 | 134.4 | 998 | - | - | L |
| | 10/00 | 39.3 | 134.7 | 998 | - | - | L |
| | 10/06 | 39.9 | 135.2 | 998 | - | - | L |
| | 10/12 | 39.9 | 135.6 | 1000 | - | - | L |
| | 10/18 | 39.9 | 136.0 | 1000 | - | - | L |
| | 11/00 | 40.0 | 136.8 | 1000 | - | - | L |
| | 11/06 | 40.5 | 137.7 | 1000 | - | - | L |
| | 11/12 | 41.0 | 138.5 | 1000 | - | - | L |
| | 11/18 | | | | | | Dissip. |

## Vamco (1519)

| Date/Time (UTC) | | Center position Lat (N) | Lon (E) | Central pressure (hPa) | Max wind (kt) | CI num. | Grade |
|---|---|---|---|---|---|---|---|
| Sep. | 13/00 | 15.6 | 112.9 | 1006 | - | 0.5 | TD |
| | 13/06 | 15.6 | 112.2 | 1004 | - | 1.0 | TD |
| | 13/12 | 15.3 | 111.4 | 1002 | - | 1.5 | TD |
| | 13/18 | 15.1 | 110.8 | 1000 | 35 | 2.0 | TS |
| | 14/00 | 15.0 | 110.3 | 998 | 35 | 2.5 | TS |
| | 14/06 | 15.6 | 109.7 | 998 | 35 | 2.5 | TS |
| | 14/12 | 15.6 | 108.9 | 998 | 35 | 2.5 | TS |
| | 14/18 | 15.8 | 107.3 | 1000 | 35 | 2.5 | TS |
| | 15/00 | 15.3 | 106.2 | 1002 | - | 2.0 | TD |
| | 15/06 | 14.3 | 105.8 | 1002 | - | - | TD |
| | 15/12 | | | | | | Dissip. |

## Krovanh (1520)

| Date/Time (UTC) | | Center position Lat (N) | Lon (E) | Central pressure (hPa) | Max wind (kt) | CI num. | Grade |
|---|---|---|---|---|---|---|---|
| Sep. | 13/18 | 13.9 | 151.6 | 1004 | - | 0.0 | TD |
| | 14/00 | 14.2 | 151.1 | 1002 | - | 1.0 | TD |
| | 14/06 | 14.9 | 150.8 | 1002 | - | 1.5 | TD |
| | 14/12 | 15.7 | 150.9 | 1002 | - | 2.0 | TD |
| | 14/18 | 16.8 | 150.8 | 1002 | - | 2.0 | TD |
| | 15/00 | 17.7 | 150.6 | 1002 | - | 2.0 | TD |
| | 15/06 | 18.3 | 150.1 | 1002 | - | 2.0 | TD |
| | 15/12 | 18.5 | 149.7 | 1002 | - | 2.0 | TD |
| | 15/18 | 18.7 | 149.1 | 996 | 35 | 2.5 | TS |
| | 16/00 | 19.2 | 148.4 | 990 | 45 | 3.0 | TS |
| | 16/06 | 19.8 | 147.3 | 985 | 55 | 3.5 | STS |
| | 16/12 | 19.9 | 146.4 | 980 | 60 | 3.5 | STS |
| | 16/18 | 20.3 | 145.7 | 970 | 65 | 4.0 | TY |
| | 17/00 | 21.0 | 144.8 | 965 | 70 | 4.5 | TY |
| | 17/06 | 21.6 | 144.2 | 960 | 75 | 4.5 | TY |
| | 17/12 | 22.2 | 143.5 | 945 | 85 | 5.5 | TY |
| | 17/18 | 22.9 | 142.9 | 945 | 85 | 5.5 | TY |
| | 18/00 | 23.7 | 142.5 | 945 | 85 | 5.5 | TY |
| | 18/06 | 24.6 | 142.3 | 950 | 80 | 5.0 | TY |
| | 18/09 | 25.1 | 142.3 | 950 | 80 | - | TY |
| | 18/12 | 25.5 | 142.4 | 950 | 80 | 5.0 | TY |
| | 18/15 | 25.9 | 142.3 | 950 | 80 | - | TY |
| | 18/18 | 26.7 | 142.8 | 955 | 75 | 4.5 | TY |
| | 18/21 | 27.3 | 143.1 | 960 | 70 | - | TY |
| | 19/00 | 27.9 | 143.3 | 965 | 70 | 4.5 | TY |
| | 19/03 | 28.3 | 143.6 | 965 | 70 | - | TY |
| | 19/06 | 28.9 | 144.2 | 965 | 70 | 4.5 | TY |
| | 19/12 | 30.0 | 145.2 | 970 | 65 | 4.0 | TY |
| | 19/18 | 31.0 | 146.1 | 975 | 60 | 3.5 | STS |
| | 20/00 | 31.9 | 147.1 | 985 | 50 | 3.0 | STS |
| | 20/06 | 32.9 | 148.1 | 990 | 45 | 2.5 | TS |
| | 20/12 | 33.9 | 149.1 | 992 | 40 | 2.5 | TS |
| | 20/18 | 35.1 | 150.6 | 992 | 40 | 2.0 | TS |
| | 21/00 | 36.1 | 151.4 | 992 | 45 | - | TS |
| | 21/06 | 36.5 | 151.9 | 992 | 40 | - | TS |
| | 21/12 | 37.0 | 152.2 | 992 | - | - | L |
| | 21/18 | 37.8 | 152.5 | 992 | - | - | L |
| | 22/00 | 39.1 | 153.2 | 992 | - | - | L |
| | 22/06 | 40.5 | 153.9 | 990 | - | - | L |
| | 22/12 | 42.3 | 155.1 | 988 | - | - | L |
| | 22/18 | 43.0 | 155.0 | 988 | - | - | L |
| | 23/00 | 42.6 | 154.4 | 992 | - | - | L |
| | 23/06 | 41.4 | 154.7 | 992 | - | - | L |
| | 23/12 | 40.3 | 155.8 | 992 | - | - | L |
| | 23/18 | 39.6 | 157.2 | 992 | - | - | L |
| | 24/00 | 39.4 | 158.8 | 992 | - | - | L |
| | 24/06 | 39.6 | 160.8 | 992 | - | - | L |
| | 24/12 | 39.9 | 162.3 | 992 | - | - | L |
| | 24/18 | 40.9 | 164.2 | 992 | - | - | L |
| | 25/00 | 41.7 | 165.4 | 994 | - | - | L |
| | 25/06 | 42.4 | 166.8 | 994 | - | - | L |
| | 25/12 | 43.0 | 168.1 | 994 | - | - | L |
| | 25/18 | 43.4 | 169.6 | 994 | - | - | L |
| | 26/00 | 43.7 | 171.3 | 996 | - | - | L |
| | 26/06 | 44.4 | 174.0 | 996 | - | - | L |
| | 26/12 | | | | | | Dissip. |

### Dujuan (1521)

| Date/Time (UTC) | | Center position Lat (N) | Lon (E) | Central pressure (hPa) | Max wind (kt) | CI num. | Grade |
|---|---|---|---|---|---|---|---|
| Sep. | 19/18 | 13.5 | 148.1 | 1004 | - | - | TD |
| | 20/00 | 13.8 | 148.0 | 1002 | - | - | TD |
| | 20/06 | 14.4 | 147.3 | 1000 | - | - | TD |
| | 20/12 | 14.7 | 146.3 | 1002 | - | - | TD |
| | 20/18 | 15.0 | 145.5 | 1000 | - | 0.0 | TD |
| | 21/00 | 15.1 | 144.7 | 1000 | - | 0.5 | TD |
| | 21/06 | 15.4 | 143.2 | 1002 | - | 0.5 | TD |
| | 21/12 | 15.2 | 141.5 | 1002 | - | 1.0 | TD |
| | 21/18 | 15.6 | 140.2 | 1002 | - | 1.5 | TD |
| | 22/00 | 15.8 | 138.8 | 1002 | - | 1.5 | TD |
| | 22/06 | 15.9 | 138.1 | 1002 | - | 1.5 | TD |
| | 22/12 | 16.2 | 137.5 | 1000 | 35 | 1.5 | TS |
| | 22/18 | 16.8 | 136.5 | 1000 | 35 | 2.0 | TS |
| | 23/00 | 17.5 | 135.4 | 1000 | 35 | 2.0 | TS |
| | 23/06 | 17.5 | 134.5 | 998 | 35 | 2.0 | TS |
| | 23/12 | 17.8 | 133.8 | 998 | 35 | 2.0 | TS |
| | 23/18 | 17.9 | 133.5 | 996 | 40 | 2.5 | TS |
| | 24/00 | 18.2 | 133.1 | 994 | 45 | 2.5 | TS |
| | 24/06 | 18.6 | 132.6 | 990 | 50 | 2.5 | STS |
| | 24/12 | 18.7 | 132.4 | 985 | 50 | 3.0 | STS |
| | 24/18 | 18.9 | 132.3 | 980 | 55 | 3.5 | STS |
| | 25/00 | 19.1 | 132.1 | 975 | 60 | 3.5 | STS |
| | 25/06 | 19.4 | 131.7 | 970 | 65 | 4.0 | TY |
| | 25/12 | 19.7 | 131.3 | 965 | 70 | 4.0 | TY |
| | 25/18 | 20.3 | 131.0 | 960 | 75 | 5.0 | TY |
| | 26/00 | 20.9 | 130.3 | 960 | 75 | 5.0 | TY |
| | 26/06 | 21.6 | 129.7 | 955 | 80 | 5.0 | TY |
| | 26/12 | 21.9 | 128.9 | 945 | 90 | 6.0 | TY |
| | 26/18 | 22.2 | 128.1 | 935 | 100 | 6.5 | TY |
| | 27/00 | 22.3 | 127.5 | 925 | 110 | 6.5 | TY |
| | 27/03 | 22.3 | 127.1 | 925 | 110 | - | TY |
| | 27/06 | 22.5 | 126.8 | 925 | 110 | 6.5 | TY |
| | 27/09 | 22.6 | 126.4 | 925 | 110 | - | TY |
| | 27/12 | 22.7 | 125.9 | 925 | 110 | 6.5 | TY |
| | 27/15 | 22.8 | 125.4 | 925 | 110 | - | TY |
| | 27/18 | 23.0 | 124.9 | 925 | 110 | 6.5 | TY |
| | 27/21 | 23.1 | 124.4 | 925 | 110 | - | TY |
| | 28/00 | 23.3 | 123.9 | 925 | 110 | 6.5 | TY |
| | 28/03 | 23.6 | 123.4 | 925 | 110 | - | TY |
| | 28/06 | 24.1 | 122.9 | 925 | 110 | 6.0 | TY |
| | 28/09 | 24.4 | 122.0 | 935 | 100 | - | TY |
| | 28/12 | 24.3 | 121.0 | 965 | 75 | 6.0 | TY |
| | 28/18 | 24.3 | 120.0 | 975 | 65 | 5.0 | TY |
| | 29/00 | 24.9 | 118.9 | 985 | 55 | 5.0 | STS |
| | 29/06 | 25.6 | 117.8 | 994 | 40 | 4.5 | TS |
| | 29/12 | 26.4 | 116.4 | 1004 | - | 4.0 | TD |
| | 29/18 | 27.4 | 115.9 | 1006 | - | - | TD |
| | 30/00 | 27.9 | 116.1 | 1010 | - | - | TD |
| | 30/06 | 28.7 | 116.7 | 1010 | - | - | TD |
| | 30/12 | | | | | | Dissip. |

### Mujigae (1522)

| Date/Time (UTC) | | Center position Lat (N) | Lon (E) | Central pressure (hPa) | Max wind (kt) | CI num. | Grade |
|---|---|---|---|---|---|---|---|
| Sep. | 30/18 | 12.6 | 126.4 | 1008 | - | 1.0 | TD |
| Oct. | 01/00 | 13.9 | 125.2 | 1008 | - | 1.5 | TD |
| | 01/06 | 14.5 | 123.8 | 1006 | - | 1.5 | TD |
| | 01/12 | 15.2 | 122.7 | 1002 | 35 | 2.0 | TS |
| | 01/18 | 15.8 | 121.3 | 998 | 40 | 2.0 | TS |
| | 02/00 | 16.4 | 120.1 | 998 | 40 | 2.0 | TS |
| | 02/06 | 16.5 | 118.9 | 996 | 45 | 2.5 | TS |
| | 02/12 | 16.9 | 117.8 | 990 | 50 | 3.0 | STS |
| | 02/18 | 17.7 | 116.6 | 985 | 55 | 3.5 | STS |
| | 03/00 | 18.5 | 115.5 | 985 | 55 | 3.5 | STS |
| | 03/06 | 18.9 | 114.4 | 985 | 55 | 3.5 | STS |
| | 03/12 | 19.5 | 113.4 | 975 | 65 | 4.0 | TY |
| | 03/18 | 19.7 | 112.2 | 965 | 75 | 5.0 | TY |
| | 04/00 | 20.5 | 111.5 | 950 | 85 | 5.5 | TY |
| | 04/06 | 21.3 | 110.4 | 950 | 85 | 6.0 | TY |
| | 04/12 | 21.9 | 109.6 | 970 | 70 | 5.0 | TY |
| | 04/18 | 22.6 | 108.8 | 990 | 50 | 4.5 | STS |
| | 05/00 | 23.6 | 108.2 | 1008 | - | 4.0 | TD |
| | 05/06 | | | | | | Dissip. |

### Choi-wan (1523)

| Date/Time (UTC) | | Center position Lat (N) | Lon (E) | Central pressure (hPa) | Max wind (kt) | CI num. | Grade |
|---|---|---|---|---|---|---|---|
| Oct. | 01/06 | 16.9 | 166.9 | 1000 | - | 0.5 | TD |
| | 01/12 | 17.5 | 167.1 | 1000 | - | 0.5 | TD |
| | 01/18 | 17.8 | 167.2 | 998 | - | 1.0 | TD |
| | 02/00 | 18.2 | 167.2 | 998 | - | 1.5 | TD |
| | 02/06 | 18.5 | 167.2 | 996 | 35 | 1.5 | TS |
| | 02/12 | 18.8 | 167.1 | 996 | 35 | 1.5 | TS |
| | 02/18 | 19.1 | 166.9 | 992 | 35 | 1.5 | TS |
| | 03/00 | 19.3 | 166.4 | 990 | 35 | 2.0 | TS |
| | 03/06 | 19.5 | 166.1 | 990 | 35 | 2.0 | TS |
| | 03/12 | 20.0 | 164.2 | 990 | 40 | 2.0 | TS |
| | 03/18 | 20.1 | 162.1 | 990 | 40 | 2.5 | TS |
| | 04/00 | 20.2 | 160.3 | 985 | 45 | 2.5 | TS |
| | 04/06 | 20.8 | 158.8 | 985 | 45 | 2.5 | TS |
| | 04/12 | 21.4 | 157.4 | 980 | 45 | 3.0 | TS |
| | 04/18 | 21.7 | 156.1 | 980 | 45 | 3.0 | TS |
| | 05/00 | 21.8 | 154.9 | 975 | 50 | 3.0 | STS |
| | 05/06 | 22.0 | 153.8 | 975 | 50 | 3.5 | STS |
| | 05/12 | 22.4 | 152.9 | 975 | 50 | 3.5 | STS |
| | 05/18 | 22.9 | 151.9 | 975 | 50 | 3.5 | STS |
| | 06/00 | 23.4 | 151.2 | 975 | 50 | 3.5 | STS |
| | 06/06 | 24.1 | 150.9 | 970 | 55 | 3.5 | STS |
| | 06/12 | 25.2 | 150.9 | 970 | 55 | 4.0 | STS |
| | 06/18 | 26.5 | 150.9 | 970 | 55 | 4.0 | STS |
| | 07/00 | 28.5 | 151.3 | 965 | 60 | 4.0 | STS |
| | 07/06 | 31.2 | 151.2 | 965 | 60 | 3.5 | STS |
| | 07/12 | 34.5 | 150.3 | 965 | 60 | 3.0 | STS |
| | 07/18 | 37.4 | 149.8 | 960 | - | 2.5 | L |
| | 08/00 | 39.5 | 148.5 | 956 | - | 2.0 | L |
| | 08/06 | 40.9 | 148.1 | 952 | - | 1.5 | L |
| | 08/12 | 43.1 | 147.7 | 956 | - | - | L |
| | 08/18 | 44.7 | 148.4 | 960 | - | - | L |
| | 09/00 | 46.0 | 148.2 | 966 | - | - | L |
| | 09/06 | 46.7 | 147.2 | 968 | - | - | L |
| | 09/12 | 47.1 | 146.8 | 976 | - | - | L |
| | 09/18 | 47.7 | 147.3 | 980 | - | - | L |
| | 10/00 | 48.8 | 147.5 | 988 | - | - | L |
| | 10/06 | 50.0 | 147.8 | 992 | - | - | L |
| | 10/12 | 51.2 | 147.7 | 992 | - | - | L |
| | 10/18 | 52.2 | 148.1 | 994 | - | - | L |
| | 11/00 | 53.0 | 149.1 | 994 | - | - | L |
| | 11/06 | 54.0 | 150.3 | 992 | - | - | L |
| | 11/12 | 54.7 | 151.2 | 994 | - | - | L |
| | 11/18 | 55.8 | 153.5 | 996 | - | - | L |
| | 12/00 | | | | | | Dissip. |

### Koppu (1524)

| Date/Time (UTC) | | Center position Lat (N) | Lon (E) | Central pressure (hPa) | Max wind (kt) | CI num. | Grade |
|---|---|---|---|---|---|---|---|
| Oct. | 12/00 | 13.8 | 151.0 | 1004 | - | 0.5 | TD |
| | 12/06 | 14.4 | 148.9 | 1004 | - | 0.5 | TD |
| | 12/12 | 14.8 | 147.4 | 1004 | - | 0.5 | TD |
| | 12/18 | 15.5 | 145.6 | 1002 | - | 1.0 | TD |
| | 13/00 | 15.9 | 142.7 | 1002 | - | 1.5 | TD |
| | 13/06 | 16.0 | 140.5 | 1002 | - | 1.5 | TD |
| | 13/12 | 16.0 | 139.2 | 1000 | 35 | 1.5 | TS |
| | 13/18 | 15.9 | 137.7 | 1000 | 35 | 2.0 | TS |
| | 14/00 | 15.9 | 136.4 | 1000 | 35 | 2.0 | TS |
| | 14/06 | 15.7 | 135.1 | 1000 | 35 | 2.0 | TS |
| | 14/12 | 15.6 | 134.0 | 1000 | 35 | 2.0 | TS |
| | 14/18 | 15.5 | 133.0 | 998 | 35 | 2.0 | TS |
| | 15/00 | 15.4 | 131.7 | 996 | 40 | 2.5 | TS |
| | 15/06 | 15.5 | 130.0 | 990 | 50 | 3.0 | STS |
| | 15/12 | 15.5 | 129.0 | 980 | 60 | 3.5 | STS |
| | 15/18 | 15.5 | 128.1 | 970 | 70 | 4.0 | TY |
| | 16/00 | 15.7 | 127.2 | 960 | 80 | 4.5 | TY |
| | 16/06 | 15.6 | 126.2 | 955 | 85 | 5.0 | TY |
| | 16/12 | 15.7 | 125.7 | 955 | 85 | 5.0 | TY |
| | 16/18 | 15.8 | 125.1 | 950 | 90 | 5.0 | TY |
| | 17/00 | 15.8 | 124.5 | 940 | 90 | 5.5 | TY |
| | 17/06 | 15.8 | 123.8 | 930 | 95 | 6.0 | TY |
| | 17/12 | 15.9 | 123.1 | 930 | 95 | 6.5 | TY |
| | 17/18 | 16.1 | 122.1 | 925 | 100 | 6.5 | TY |
| | 18/00 | 16.0 | 121.6 | 940 | 90 | 5.5 | TY |
| | 18/06 | 16.1 | 121.4 | 950 | 80 | 5.0 | TY |
| | 18/12 | 16.3 | 121.3 | 960 | 70 | 4.5 | TY |
| | 18/18 | 17.0 | 120.6 | 970 | 60 | 4.5 | STS |
| | 19/00 | 17.2 | 120.2 | 980 | 50 | 4.0 | STS |
| | 19/06 | 17.8 | 120.1 | 985 | 45 | 3.5 | TS |
| | 19/12 | 18.4 | 120.2 | 990 | 45 | 3.0 | TS |
| | 19/18 | 18.7 | 120.4 | 992 | 40 | 2.5 | TS |
| | 20/00 | 18.9 | 120.7 | 994 | 35 | 2.0 | TS |
| | 20/06 | 19.1 | 121.2 | 996 | 35 | 1.5 | TS |
| | 20/12 | 19.2 | 121.7 | 998 | 35 | 1.5 | TS |
| | 20/18 | 19.2 | 122.2 | 998 | 35 | 1.5 | TS |
| | 21/00 | 19.3 | 122.5 | 998 | 35 | 1.5 | TS |
| | 21/06 | 19.4 | 122.7 | 1000 | - | 1.5 | TD |
| | 21/12 | | | | | | Dissip. |

### Champi (1525)

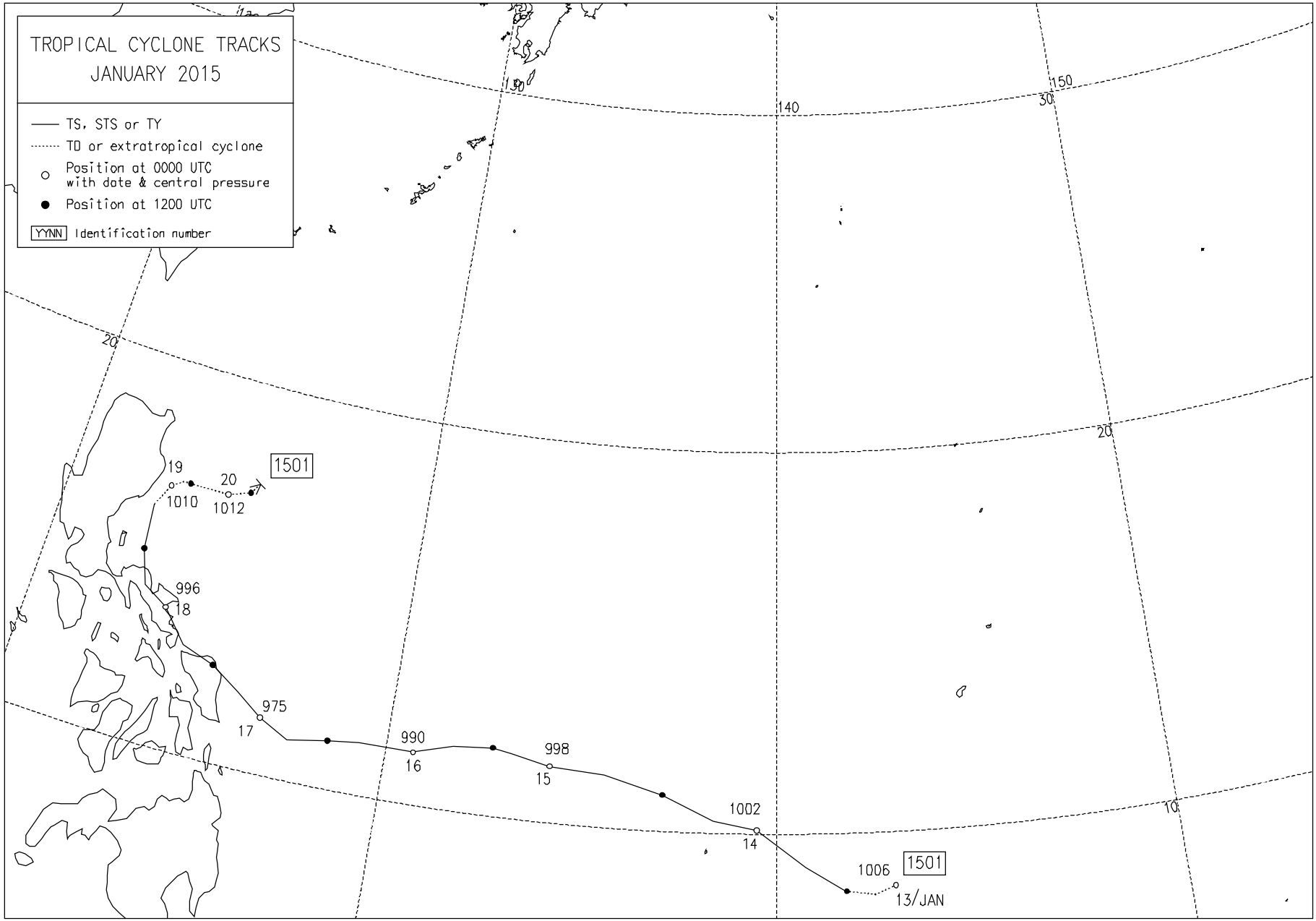
| Date/Time (UTC) | | Center position Lat (N) | Lon (E) | Central pressure (hPa) | Max wind (kt) | CI num. | Grade |
|---|---|---|---|---|---|---|---|
| Oct. | 13/00 | 12.5 | 161.4 | 1004 | - | 1.5 | TD |
| | 13/06 | 13.0 | 160.2 | 1002 | - | 1.5 | TD |
| | 13/12 | 13.2 | 159.0 | 1002 | - | 2.0 | TD |
| | 13/18 | 13.6 | 158.1 | 1000 | - | 2.5 | TD |
| | 14/00 | 14.0 | 156.7 | 1000 | 35 | 2.5 | TS |
| | 14/06 | 14.5 | 155.5 | 1000 | 35 | 2.5 | TS |
| | 14/12 | 14.7 | 154.6 | 998 | 40 | 2.5 | TS |
| | 14/18 | 15.0 | 153.7 | 996 | 45 | 2.5 | TS |
| | 15/00 | 15.4 | 151.9 | 996 | 45 | 2.5 | TS |
| | 15/06 | 15.1 | 150.3 | 996 | 45 | 2.5 | TS |
| | 15/12 | 15.4 | 149.2 | 996 | 45 | 2.5 | TS |
| | 15/18 | 15.5 | 147.6 | 990 | 55 | 3.0 | STS |
| | 16/00 | 15.4 | 145.9 | 985 | 55 | 3.0 | STS |
| | 16/06 | 15.6 | 144.8 | 980 | 60 | 3.5 | STS |
| | 16/12 | 16.2 | 144.0 | 975 | 65 | 4.0 | TY |
| | 16/18 | 16.5 | 143.3 | 975 | 65 | 4.0 | TY |
| | 17/00 | 16.9 | 142.4 | 975 | 65 | 4.0 | TY |
| | 17/06 | 17.7 | 141.5 | 965 | 75 | 4.5 | TY |
| | 17/12 | 18.4 | 140.7 | 955 | 80 | 5.0 | TY |
| | 17/18 | 18.8 | 140.3 | 955 | 80 | 5.0 | TY |
| | 18/00 | 19.2 | 140.1 | 950 | 85 | 5.5 | TY |
| | 18/06 | 19.5 | 140.1 | 940 | 90 | 6.0 | TY |
| | 18/12 | 19.8 | 140.2 | 930 | 95 | 6.5 | TY |
| | 18/18 | 20.2 | 140.3 | 930 | 95 | 6.5 | TY |
| | 19/00 | 20.5 | 140.4 | 930 | 95 | 6.5 | TY |
| | 19/06 | 20.8 | 140.3 | 935 | 90 | 6.5 | TY |
| | 19/12 | 21.0 | 140.2 | 945 | 85 | 5.5 | TY |
| | 19/18 | 21.1 | 140.1 | 945 | 85 | 5.5 | TY |
| | 20/00 | 21.4 | 140.2 | 950 | 80 | 5.0 | TY |
| | 20/06 | 21.8 | 140.2 | 950 | 80 | 5.0 | TY |
| | 20/12 | 22.1 | 140.0 | 950 | 80 | 5.0 | TY |
| | 20/18 | 22.3 | 140.0 | 950 | 80 | 5.0 | TY |
| | 21/00 | 22.6 | 140.0 | 950 | 80 | 5.0 | TY |
| | 21/06 | 22.9 | 140.1 | 950 | 80 | 5.0 | TY |
| | 21/12 | 23.2 | 140.3 | 950 | 80 | 5.0 | TY |
| | 21/18 | 23.5 | 140.7 | 950 | 80 | 5.0 | TY |
| | 22/00 | 23.7 | 141.2 | 945 | 85 | 5.5 | TY |
| | 22/06 | 24.0 | 141.8 | 945 | 85 | 5.5 | TY |
| | 22/12 | 24.2 | 142.7 | 945 | 85 | 5.5 | TY |
| | 22/18 | 24.7 | 143.9 | 945 | 85 | 5.5 | TY |
| | 23/00 | 25.0 | 145.1 | 950 | 80 | 5.0 | TY |
| | 23/06 | 25.4 | 146.6 | 955 | 75 | 5.0 | TY |
| | 23/12 | 25.8 | 147.9 | 960 | 75 | 4.5 | TY |
| | 23/18 | 26.4 | 149.2 | 970 | 65 | 4.0 | TY |
| | 24/00 | 27.0 | 150.3 | 980 | 60 | 3.5 | STS |
| | 24/06 | 27.5 | 151.6 | 980 | 60 | 3.5 | STS |
| | 24/12 | 28.3 | 153.2 | 980 | 60 | 3.0 | STS |
| | 24/18 | 29.5 | 155.2 | 980 | 60 | 3.0 | STS |
| | 25/00 | 31.3 | 158.4 | 985 | 55 | 2.5 | STS |
| | 25/06 | 33.7 | 163.2 | 985 | 55 | 2.5 | STS |
| | 25/12 | 37.0 | 167.6 | 980 | - | 2.5 | L |
| | 25/18 | 40.8 | 171.5 | 974 | - | - | L |
| | 26/00 | 43.4 | 174.8 | 976 | - | - | L |
| | 26/06 | 45.3 | 177.1 | 980 | - | - | L |
| | 26/12 | 47.2 | 178.8 | 984 | - | - | L |
| | 26/18 | 48.1 | 180.4 | 984 | - | - | Out |

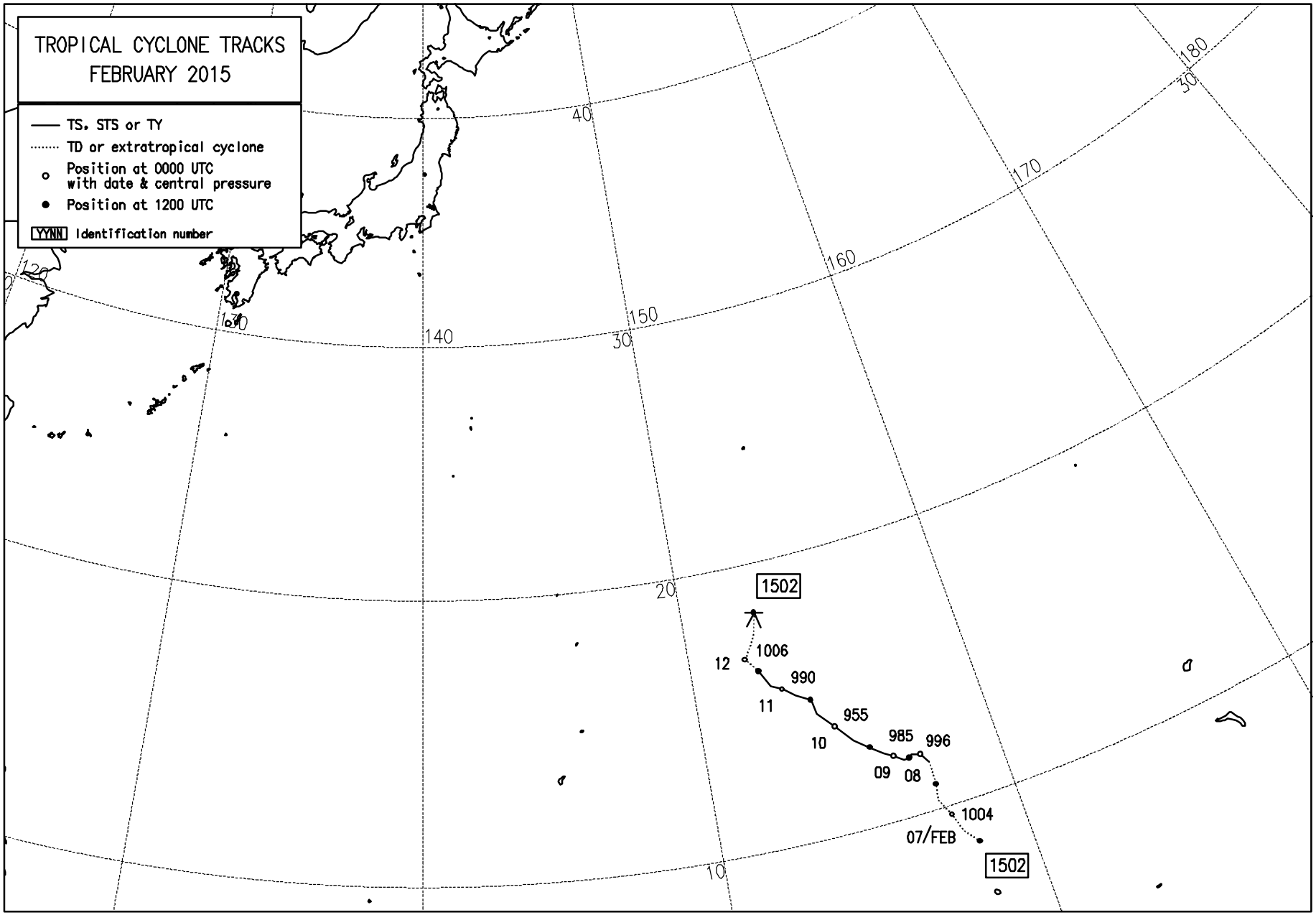
| Date/Time (UTC) | | Center position Lat (N) | Lon (E) | Central pressure (hPa) | Max wind (kt) | CI num. | Grade |
|---|---|---|---|---|---|---|---|
| **In-fa (1526)** | | | | | | | |
| Nov. | 16/18 | 3.5 | 163.6 | 1002 | - | 0.5 | TD |
| | 17/00 | 3.8 | 162.5 | 1002 | - | 0.5 | TD |
| | 17/06 | 4.3 | 161.3 | 1002 | - | 1.0 | TD |
| | 17/12 | 4.7 | 159.8 | 1002 | 35 | 1.5 | TS |
| | 17/18 | 5.2 | 158.3 | 1000 | 35 | 2.0 | TS |
| | 18/00 | 5.5 | 157.2 | 998 | 35 | 2.5 | TS |
| | 18/06 | 5.8 | 155.7 | 996 | 35 | 2.5 | TS |
| | 18/12 | 6.2 | 154.7 | 994 | 40 | 2.5 | TS |
| | 18/18 | 7.0 | 153.8 | 994 | 40 | 2.5 | TS |
| | 19/00 | 8.1 | 152.7 | 994 | 40 | 2.5 | TS |
| | 19/06 | 8.7 | 151.4 | 992 | 45 | 3.0 | TS |
| | 19/12 | 9.2 | 150.4 | 985 | 50 | 3.5 | STS |
| | 19/18 | 9.8 | 149.4 | 975 | 60 | 4.0 | STS |
| | 20/00 | 9.9 | 148.7 | 970 | 65 | 4.5 | TY |
| | 20/06 | 10.4 | 147.5 | 960 | 75 | 5.5 | TY |
| | 20/12 | 10.8 | 146.0 | 950 | 80 | 5.5 | TY |
| | 20/18 | 11.0 | 144.4 | 940 | 90 | 5.5 | TY |
| | 21/00 | 11.2 | 142.9 | 935 | 95 | 6.0 | TY |
| | 21/06 | 11.9 | 141.4 | 935 | 95 | 6.0 | TY |
| | 21/12 | 12.4 | 139.6 | 940 | 90 | 6.0 | TY |
| | 21/18 | 12.8 | 137.9 | 940 | 90 | 5.5 | TY |
| | 22/00 | 13.5 | 136.6 | 945 | 85 | 5.0 | TY |
| | 22/06 | 14.2 | 135.2 | 945 | 85 | 5.0 | TY |
| | 22/12 | 14.6 | 133.9 | 945 | 85 | 5.0 | TY |
| | 22/18 | 15.3 | 132.8 | 950 | 80 | 5.0 | TY |
| | 23/00 | 15.8 | 132.0 | 950 | 80 | 5.0 | TY |
| | 23/06 | 16.5 | 131.6 | 950 | 80 | 5.0 | TY |
| | 23/12 | 17.2 | 131.5 | 950 | 80 | 5.0 | TY |
| | 23/18 | 17.9 | 131.7 | 955 | 75 | 5.0 | TY |
| | 24/00 | 18.6 | 132.0 | 960 | 75 | 4.5 | TY |
| | 24/06 | 18.8 | 132.9 | 965 | 70 | 4.0 | TY |
| | 24/12 | 19.1 | 133.7 | 975 | 60 | 3.5 | STS |
| | 24/18 | 19.4 | 134.5 | 985 | 50 | 3.0 | STS |
| | 25/00 | 19.5 | 135.1 | 990 | 45 | 3.0 | TS |
| | 25/06 | 19.9 | 135.9 | 994 | 40 | 2.5 | TS |
| | 25/12 | 20.7 | 136.7 | 996 | 35 | 2.0 | TS |
| | 25/18 | 21.5 | 137.7 | 998 | 35 | 2.0 | TS |
| | 26/00 | 22.4 | 138.5 | 1002 | 35 | 1.5 | TS |
| | 26/06 | 23.5 | 139.8 | 1002 | 35 | - | TS |
| | 26/12 | 25.2 | 141.8 | 1002 | 35 | - | TS |
| | 26/18 | 26.8 | 144.5 | 1002 | 35 | - | TS |
| | 27/00 | 28.1 | 147.4 | 1008 | - | - | L |
| | 27/06 | 29.6 | 150.4 | 1012 | - | - | L |
| | 27/12 | | | | | | Dissip. |

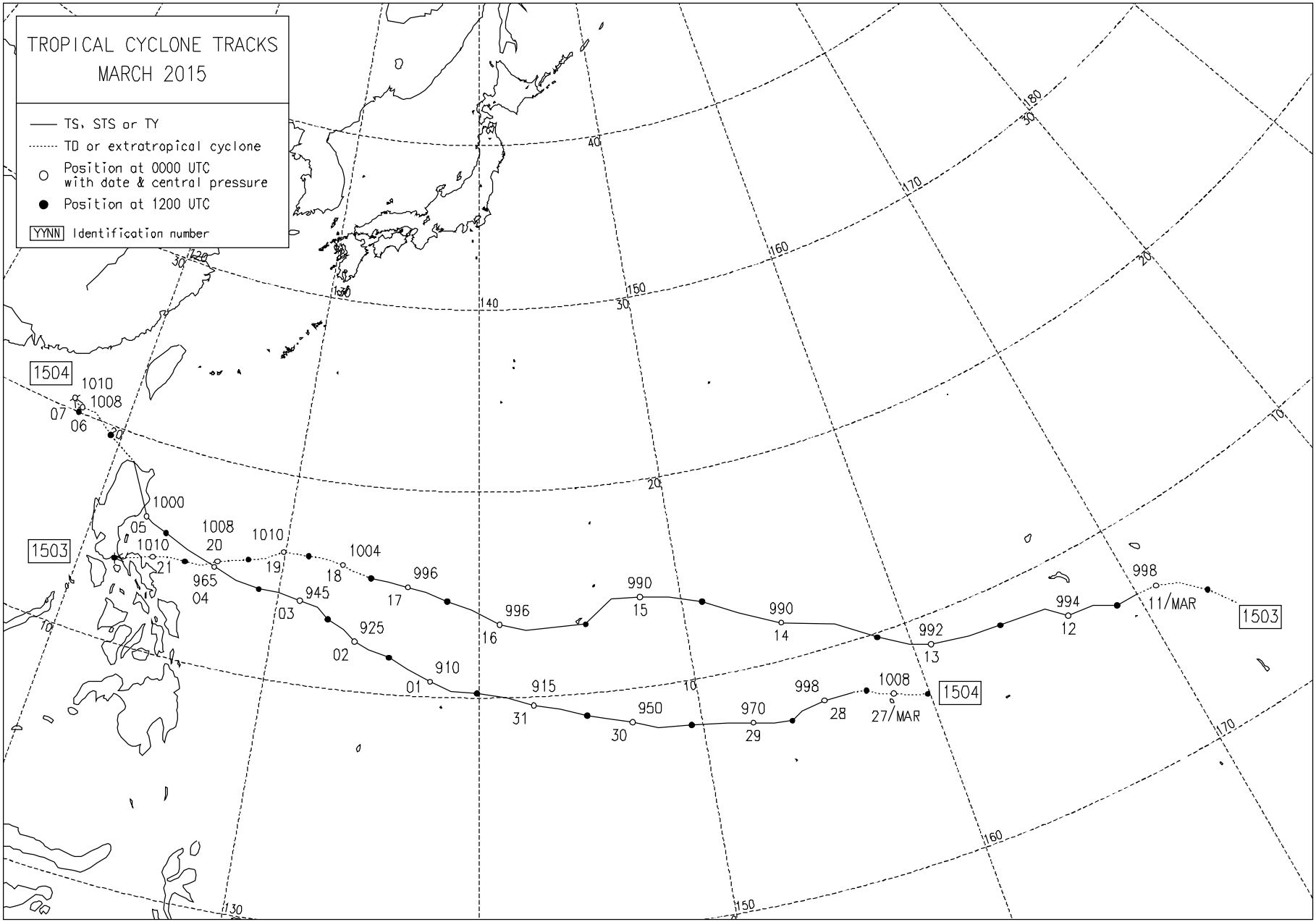
| Date/Time (UTC) | | Center position Lat (N) | Lon (E) | Central pressure (hPa) | Max wind (kt) | CI num. | Grade |
|---|---|---|---|---|---|---|---|
| **Melor (1527)** | | | | | | | |
| Dec. | 10/00 | 7.1 | 145.2 | 1008 | - | 0.5 | TD |
| | 10/06 | 7.2 | 143.9 | 1006 | - | 0.5 | TD |
| | 10/12 | 7.6 | 142.5 | 1006 | - | 0.5 | TD |
| | 10/18 | 7.9 | 141.0 | 1004 | - | 1.0 | TD |
| | 11/00 | 8.2 | 139.6 | 1004 | - | 1.5 | TD |
| | 11/06 | 8.9 | 138.0 | 1002 | 35 | 2.0 | TS |
| | 11/12 | 9.3 | 136.9 | 1002 | 35 | 2.0 | TS |
| | 11/18 | 9.8 | 135.7 | 1000 | 40 | 2.0 | TS |
| | 12/00 | 10.2 | 134.5 | 1000 | 40 | 2.5 | TS |
| | 12/06 | 10.9 | 133.6 | 994 | 45 | 3.0 | TS |
| | 12/12 | 11.2 | 132.2 | 985 | 55 | 3.5 | STS |
| | 12/18 | 11.5 | 131.2 | 975 | 65 | 4.0 | TY |
| | 13/00 | 11.9 | 130.3 | 970 | 70 | 5.0 | TY |
| | 13/06 | 12.3 | 129.1 | 955 | 80 | 5.5 | TY |
| | 13/12 | 12.4 | 128.1 | 950 | 85 | 5.5 | TY |
| | 13/18 | 12.5 | 126.9 | 950 | 85 | 5.5 | TY |
| | 14/00 | 12.5 | 125.8 | 935 | 95 | 6.0 | TY |
| | 14/06 | 12.6 | 124.6 | 935 | 95 | 6.0 | TY |
| | 14/12 | 12.8 | 123.5 | 955 | 80 | 5.0 | TY |
| | 14/18 | 12.9 | 122.6 | 955 | 80 | 4.5 | TY |
| | 15/00 | 13.0 | 121.8 | 950 | 85 | 5.5 | TY |
| | 15/06 | 13.2 | 121.2 | 950 | 85 | 5.0 | TY |
| | 15/12 | 13.4 | 120.6 | 955 | 80 | 4.5 | TY |
| | 15/18 | 13.7 | 120.1 | 970 | 70 | 4.0 | TY |
| | 16/00 | 14.1 | 120.1 | 975 | 65 | 4.0 | TY |
| | 16/06 | 14.1 | 120.3 | 990 | 50 | 3.5 | STS |
| | 16/12 | 13.7 | 120.3 | 996 | 45 | 3.0 | TS |
| | 16/18 | 13.1 | 120.3 | 1000 | 35 | 2.5 | TS |
| | 17/00 | 12.5 | 120.1 | 1008 | - | 2.0 | TD |
| | 17/06 | | | | | | Dissip. |

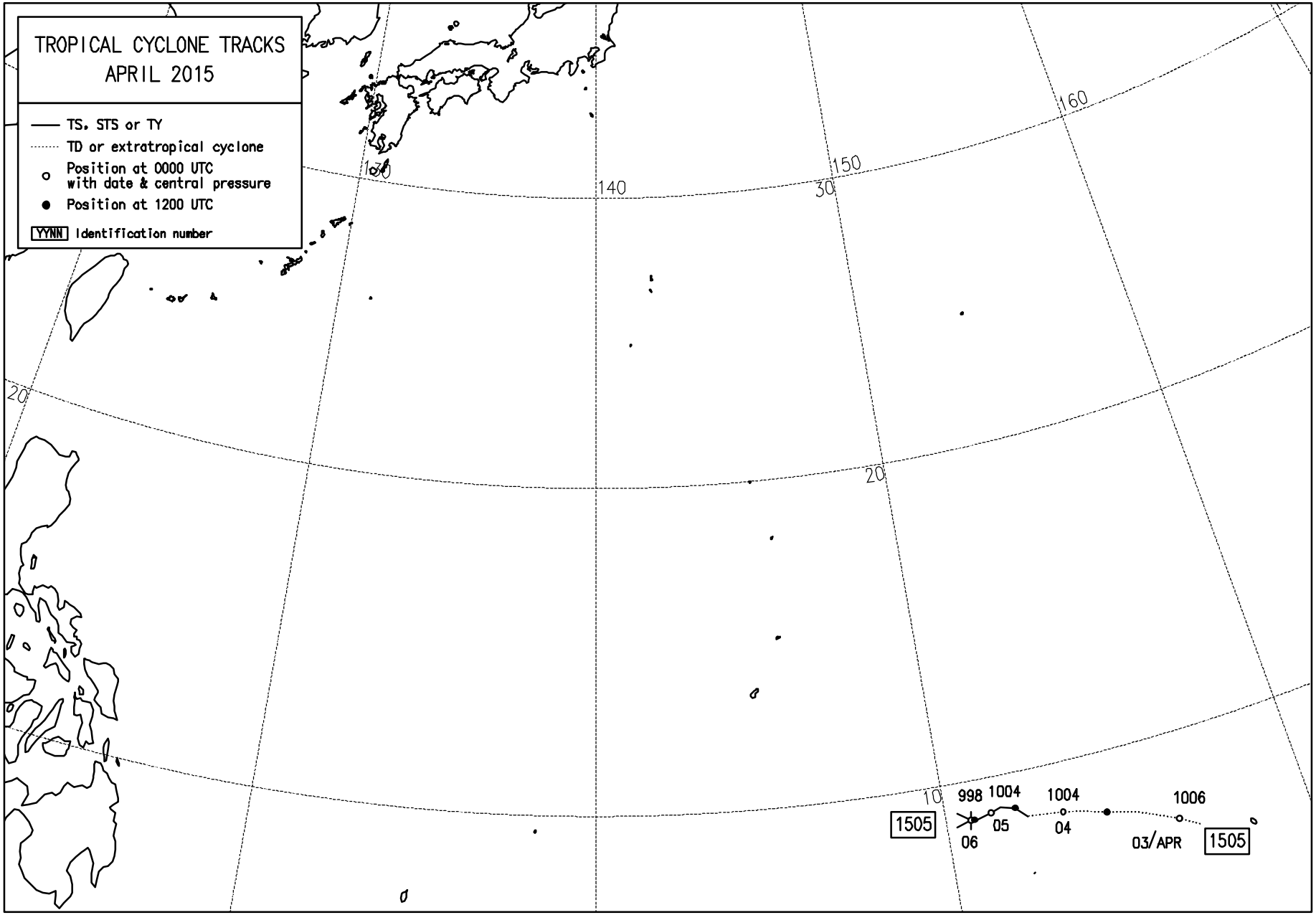
**Appendix 2**

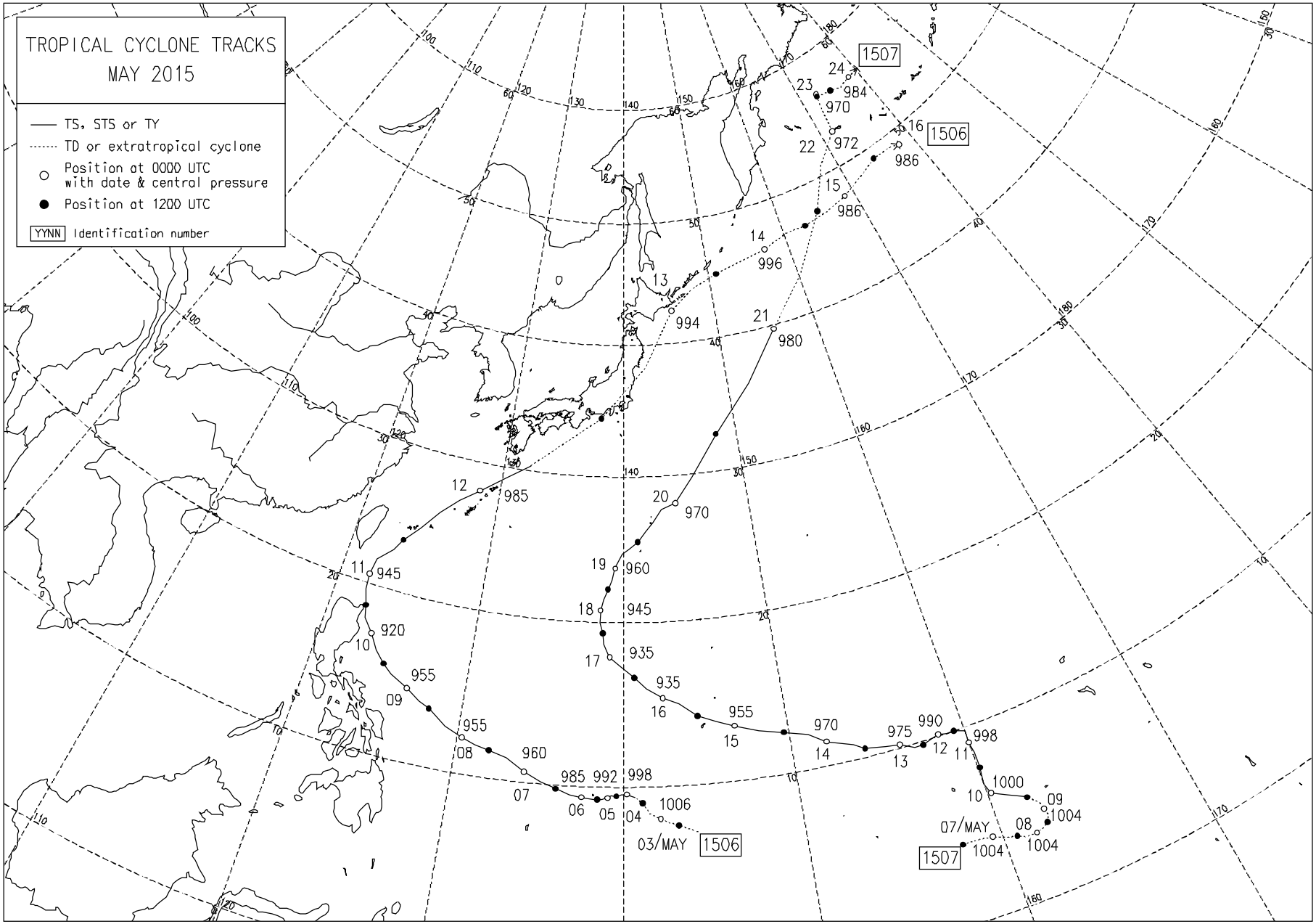
# Monthly Tracks of Tropical Cyclones in 2015

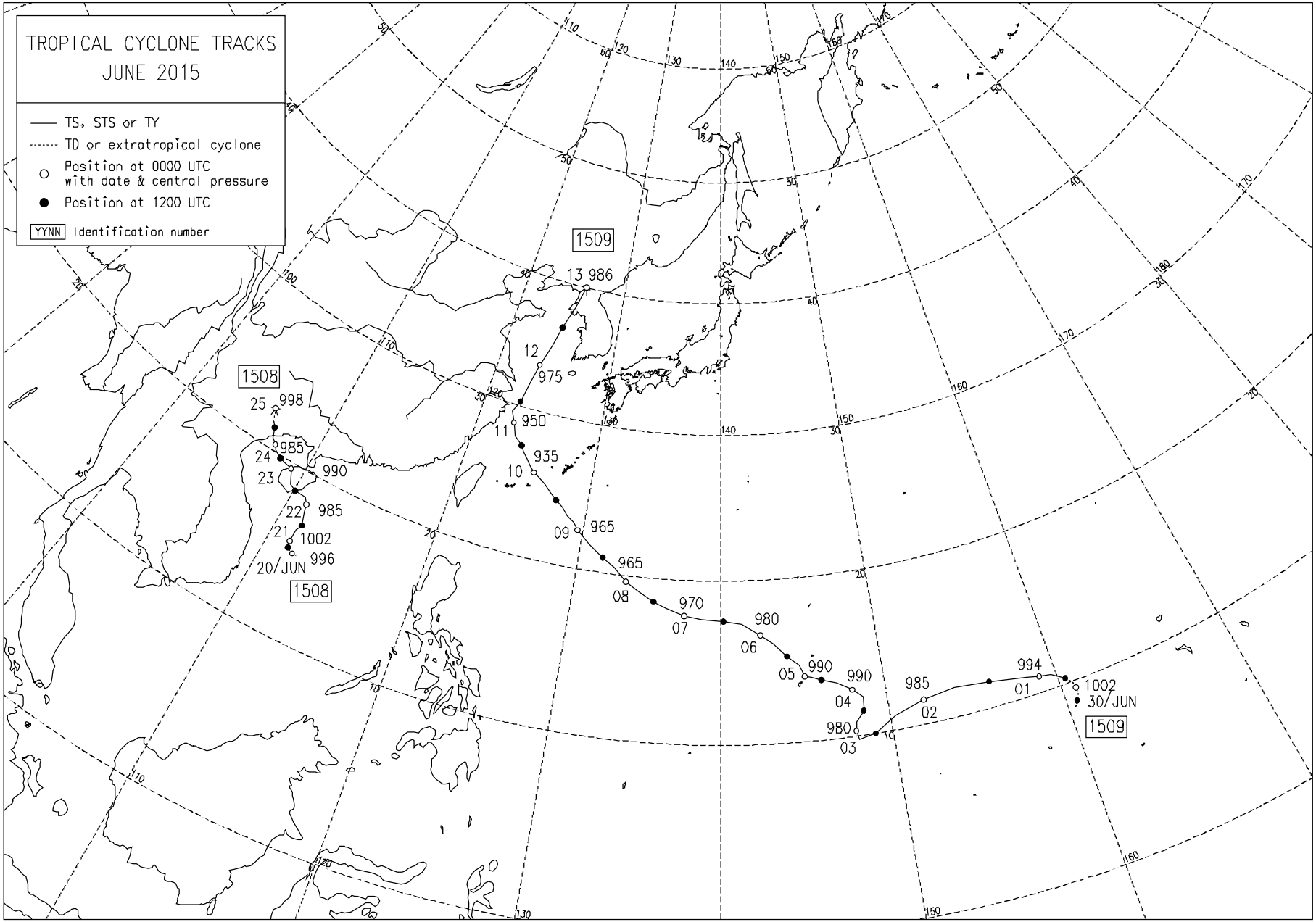

TROPICAL CYCLONE TRACKS
JANUARY 2015
TS, STS or TY
TD or extratropical cyclone
Position at 0000 UTC
with date & central pressure
Position at 1200 UTC
YYNN Identification number
140
150
30
20
10
1501
19
1010
20
1012
996
18
975
17
990
16
998
15
1002
14
1006
1501
13/JAN

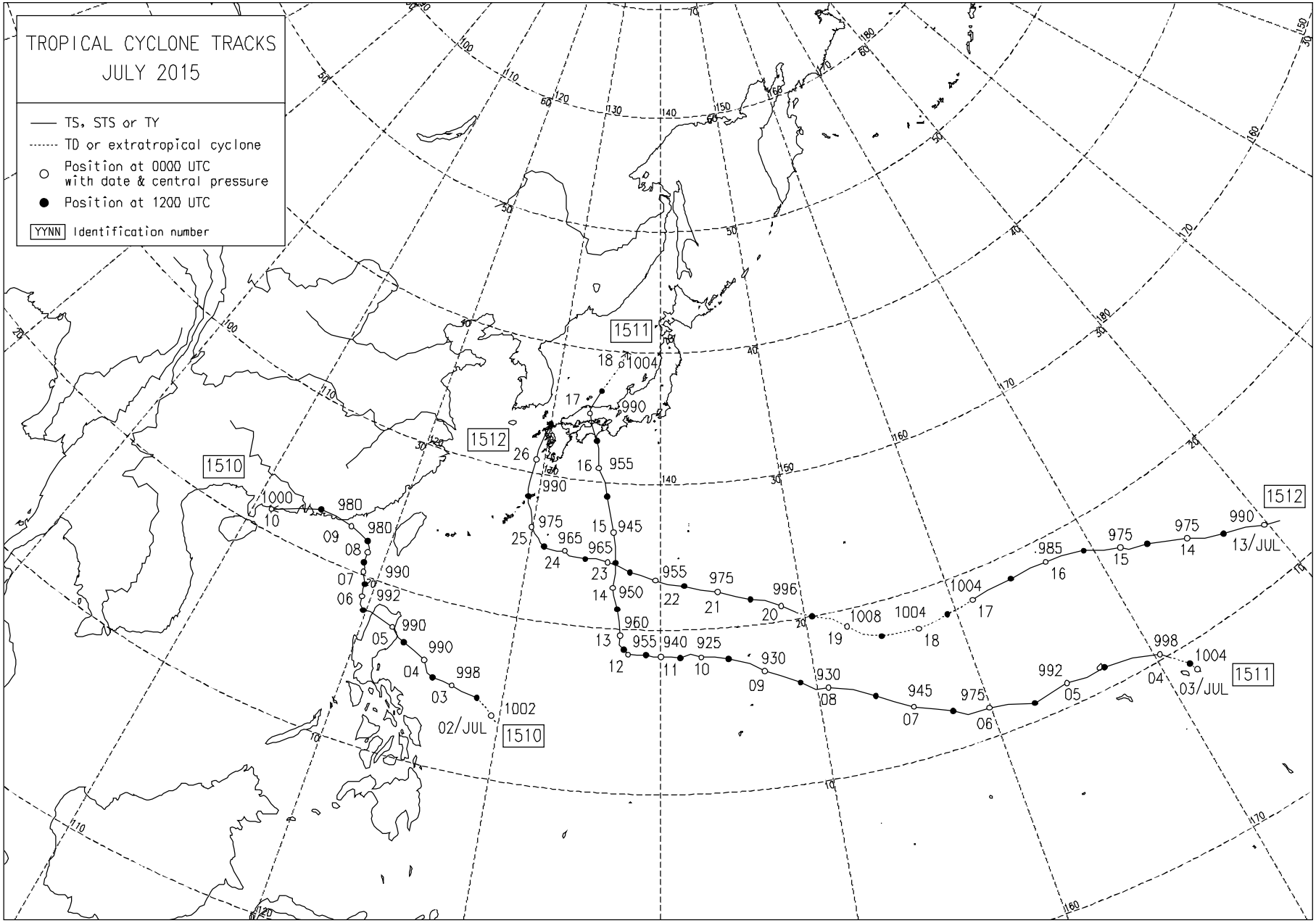

TROPICAL CYCLONE TRACKS
FEBRUARY 2015
TS, STS or TY
TD or extratropical cyclone
Position at 0000 UTC
with date & central pressure
Position at 1200 UTC
YYNN Identification number
120
130
140
150
160
170
180
40
30
20
10
1502
1006
12
990
11
955
10
985
996
09
08
1004
07/FEB
1502

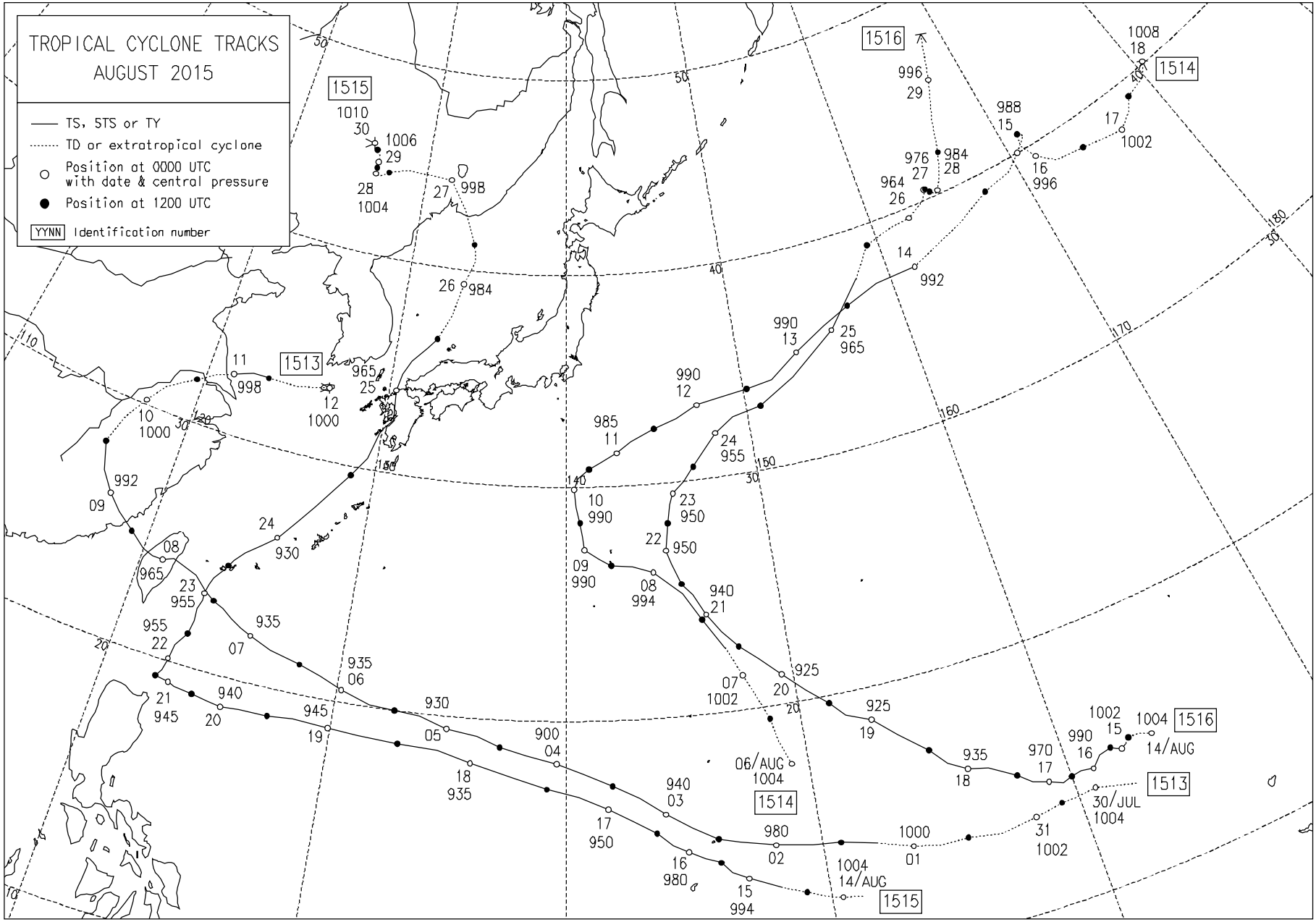

TROPICAL CYCLONE TRACKS
MARCH 2015
TS, STS or TY
TD or extratropical cyclone
Position at 0000 UTC with date & central pressure
Position at 1200 UTC
YYNN Identification number
1504
1010
1008
07
06
1000
05
1503
1010
21
1008
20
965
04
1010
19
945
03
1004
18
925
02
996
17
910
01
996
16
915
31
990
15
950
30
990
14
970
29
992
13
998
28
994
12
1008
27/MAR
998
11/MAR
1503
1504
10
20
30
40
120
130
140
150
160
170
180

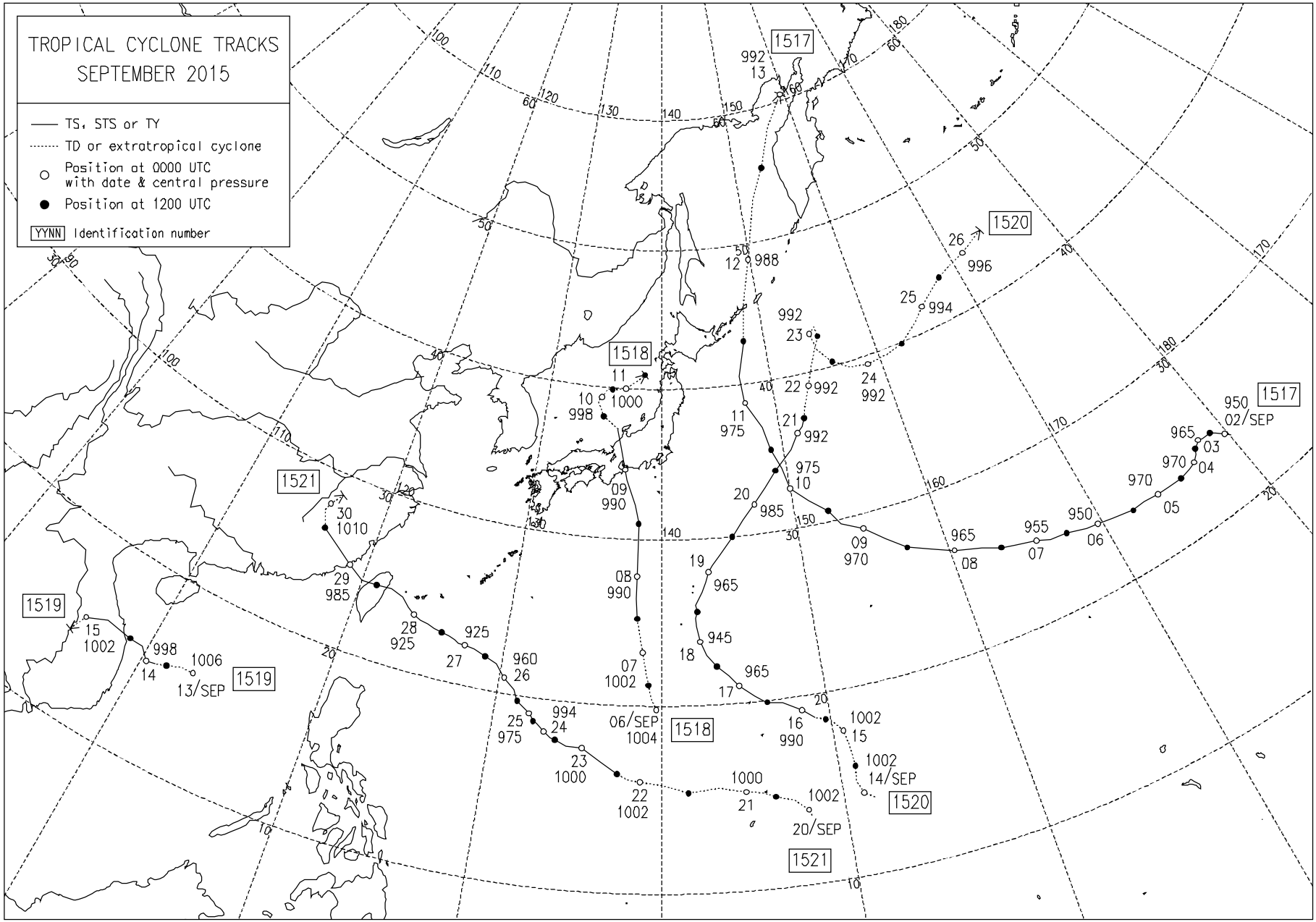

TROPICAL CYCLONE TRACKS
APRIL 2015
TS, STS or TY
TD or extratropical cyclone
Position at 0000 UTC
with date & central pressure
Position at 1200 UTC
YYNN Identification number
130
140
150
160
30
20
20
10
1505
998 1004
1004
1006
06
05
04
03/APR
1505

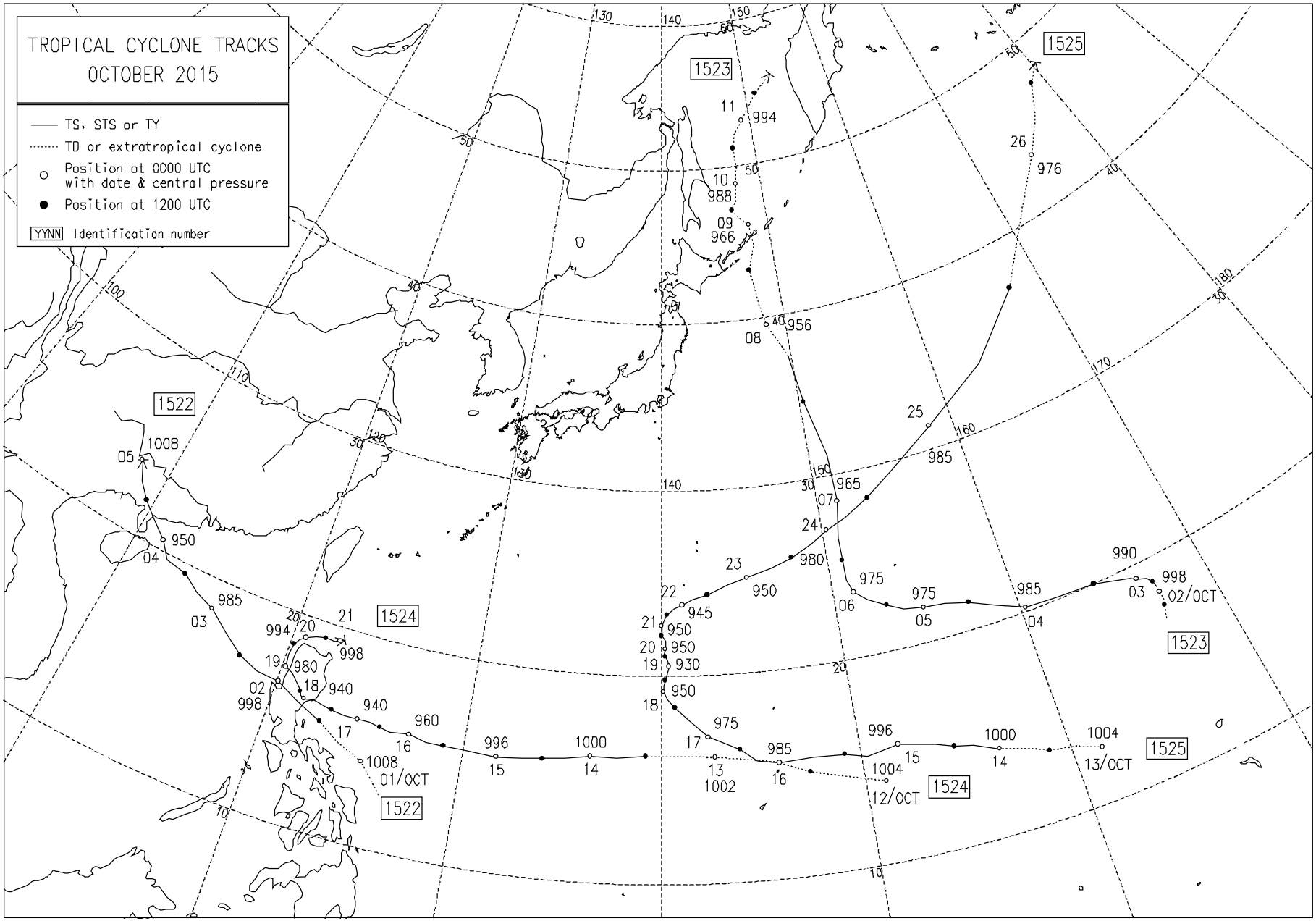

TROPICAL CYCLONE TRACKS
MAY 2015
TS, STS or TY
TD or extratropical cyclone
Position at 0000 UTC with date & central pressure
Position at 1200 UTC
YYNN Identification number
1507
1506
03/MAY
07/MAY

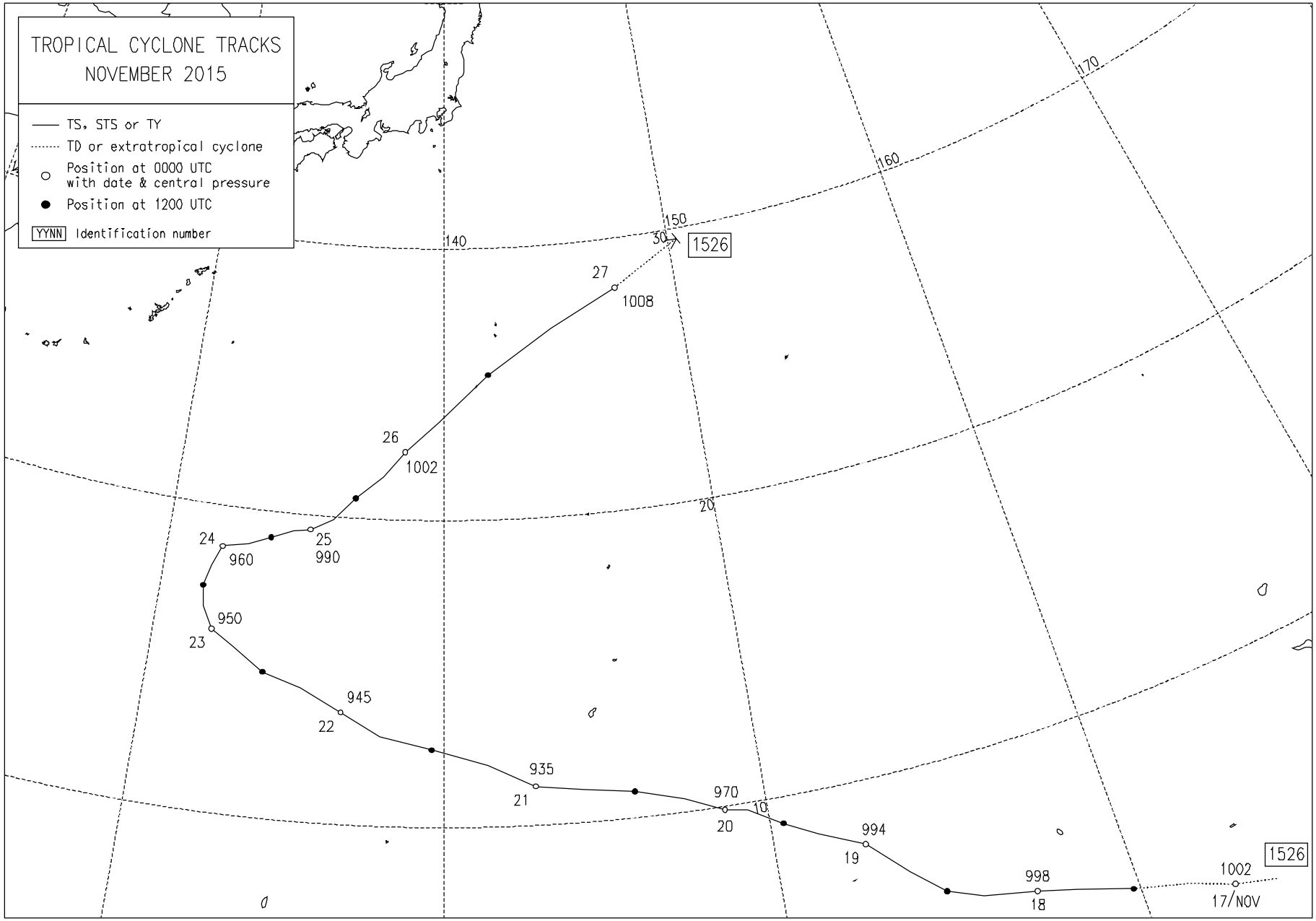

TROPICAL CYCLONE TRACKS
JUNE 2015
TS, STS or TY
TD or extratropical cyclone
Position at 0000 UTC
with date & central pressure
Position at 1200 UTC
YYNN Identification number
1509
13 986
12
975
11
950
10
935
09
965
08
965
07
970
06
980
05
990
04
990
03
980
02
985
01
994
30/JUN
1002
1509
1508
25
998
24
985
23
990
22
985
21
1002
20/JUN
996
1508

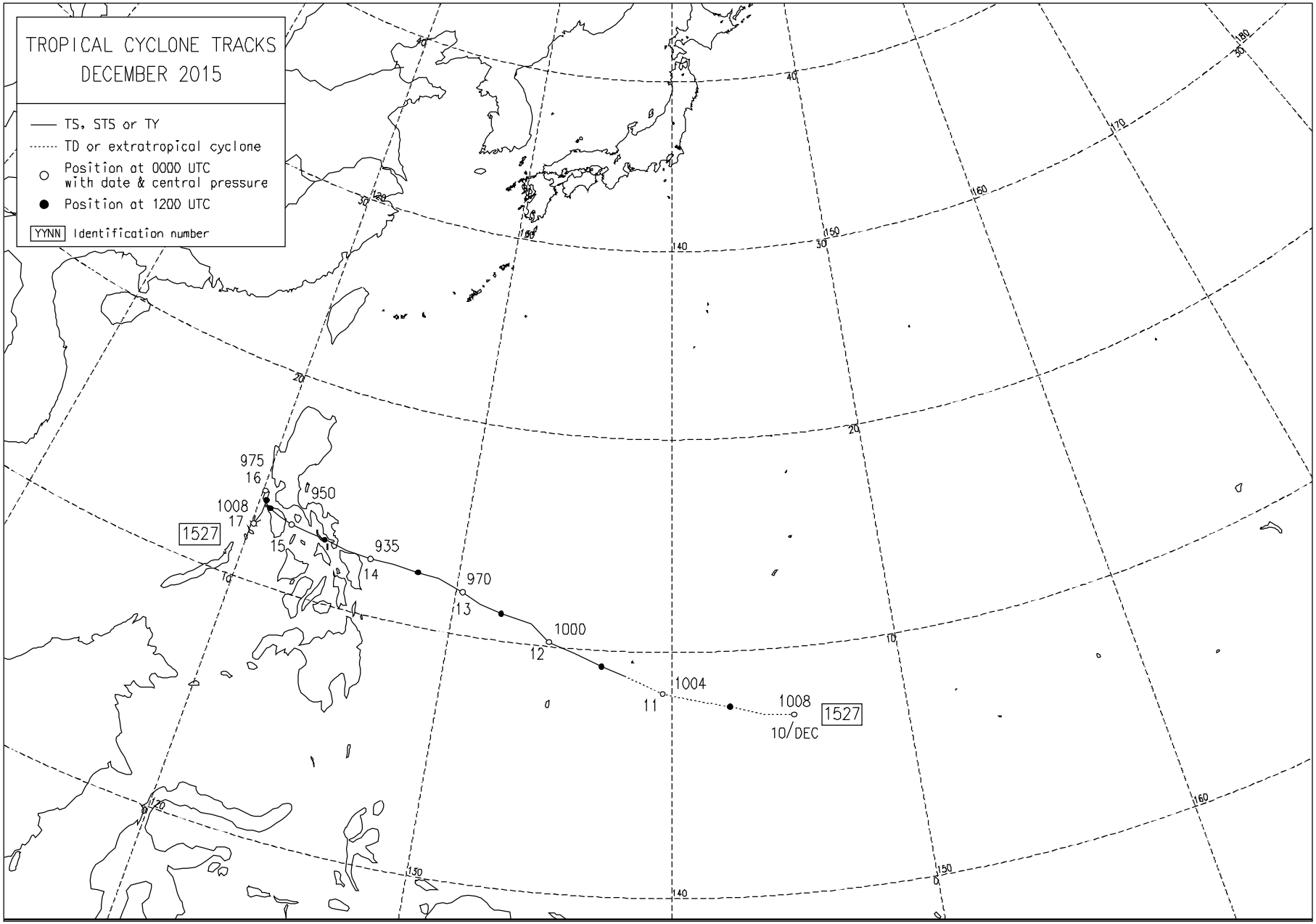

TROPICAL CYCLONE TRACKS
JULY 2015
TS, STS or TY
TD or extratropical cyclone
Position at 0000 UTC
with date & central pressure
Position at 1200 UTC
YYNN Identification number
1510
1511
1512
02/JUL
03/JUL
13/JUL


TROPICAL CYCLONE TRACKS
AUGUST 2015
TS, STS or TY
TD or extratropical cyclone
Position at 0000 UTC with date & central pressure
Position at 1200 UTC
YYNN Identification number
1515
1516
1514
1513
1010
30
1006
29
28
1004
27
998
26
984
11
998
12
1000
10
1000
965
25
992
09
08
965
23
955
24
930
955
22
21
945
940
20
935
07
945
19
935
06
930
05
18
935
900
04
17
950
940
03
16
980
15
994
1004
14/AUG
980
02
1000
01
06/AUG
1004
990
12
985
11
24
955
23
950
22
950
10
990
09
990
08
994
940
21
07
1002
925
20
20
925
19
935
18
970
17
990
16
1002
15
1004
14/AUG
1516
1513
30/JUL
1004
31
1002
1515
996
29
988
15
976
27
984
28
964
26
14
992
990
13
25
965
1008
18
1514
17
1002
16
996


TROPICAL CYCLONE TRACKS
SEPTEMBER 2015
TS, STS or TY
TD or extratropical cyclone
Position at 0000 UTC with date & central pressure
Position at 1200 UTC
YYNN Identification number
1517
1520
1518
1521
1519


TROPICAL CYCLONE TRACKS
OCTOBER 2015
TS, STS or TY
TD or extratropical cyclone
Position at 0000 UTC with date & central pressure
Position at 1200 UTC
YYNN Identification number
1522
1523
1524
1525
01/OCT
02/OCT
12/OCT
13/OCT


TROPICAL CYCLONE TRACKS
NOVEMBER 2015
TS, STS or TY
TD or extratropical cyclone
Position at 0000 UTC
with date & central pressure
Position at 1200 UTC
YYNN Identification number
140
150
160
170
20
30
1526
27
1008
26
1002
25
990
24
960
23
950
22
945
21
935
20
970
10
19
994
18
998
17/NOV
1002
1526


TROPICAL CYCLONE TRACKS
DECEMBER 2015
TS, STS or TY
TD or extratropical cyclone
Position at 0000 UTC
with date & central pressure
Position at 1200 UTC
YYNN Identification number
975
16
1008
17
1527
950
15
935
14
970
13
1000
12
1004
11
1008
10/DEC
1527

# Appendix 3

## Errors of Track and Intensity Forecasts for Each Tropical Cyclone in 2015

| Date/Time | | Center Position (km) | | | | | | Central Pressure (hPa) | | | Max. Wind (kt) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (UTC) | T=00 | =24 | =48 | =72 | =96 | =120 | T=24 | =48 | =72 | T=24 | =48 | =72 |
| **STS Mekkhala (1501)** | | | | | | | | | | | | | |
| Jan. | 13/12 | 16 | 144 | 225 | | | | 2 | 4 | | 0 | 0 | |
| | 13/18 | 22 | 22 | | | | | 0 | | | 0 | | |
| | 14/00 | 56 | 113 | 143 | | | | 0 | 4 | | 0 | 0 | |
| | 14/06 | 0 | 122 | 238 | 241 | 321 | | 0 | 5 | 10 | 5 | -5 | -10 |
| | 14/12 | 24 | 33 | 158 | 156 | 204 | | 2 | 10 | -5 | 0 | -5 | 5 |
| | 14/18 | 90 | 24 | 110 | 59 | | | 2 | 15 | -7 | 0 | -15 | 10 |
| | 15/00 | 65 | 33 | 73 | 109 | | | 2 | 10 | -11 | 0 | -10 | 15 |
| | 15/06 | 11 | 25 | 31 | 127 | | | 7 | 10 | -6 | -5 | -10 | 10 |
| | 15/12 | 70 | 22 | 86 | 178 | | | 12 | 2 | -4 | -5 | 0 | 5 |
| | 15/18 | 47 | 35 | 64 | | | | 17 | 0 | | -15 | 5 | |
| | 16/00 | 22 | 45 | 57 | | | | 17 | -2 | | -15 | 5 | |
| | 16/06 | 0 | 34 | 74 | | | | 15 | -2 | | -15 | 5 | |
| | 16/12 | 45 | 24 | 113 | | | | -15 | -15 | | 15 | 15 | |
| | 16/18 | 16 | 0 | | | | | -12 | | | 15 | | |
| | 17/00 | 16 | 74 | | | | | -11 | | | 20 | | |
| | 17/06 | 11 | 46 | | | | | -4 | | | 5 | | |
| | 17/12 | 0 | 79 | | | | | -4 | | | 5 | | |
| | 17/18 | 25 | | | | | | | | | | | |
| | 18/00 | 22 | | | | | | | | | | | |
| | 18/06 | 11 | | | | | | | | | | | |
| | 18/12 | 11 | | | | | | | | | | | |
| | mean | 28 | 52 | 114 | 145 | 262 | -- | 2 | 3 | -4 | 1 | -1 | 6 |
| | sample | 21 | 17 | 12 | 6 | 2 | 0 | 17 | 12 | 6 | 17 | 12 | 6 |

| Date/Time | | Center Position (km) | | | | | | Central Pressure (hPa) | | | Max. Wind (kt) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (UTC) | T=00 | =24 | =48 | =72 | =96 | =120 | T=24 | =48 | =72 | T=24 | =48 | =72 |
| **TY Higos (1502)** | | | | | | | | | | | | | |
| Feb. | 07/18 | 25 | 31 | 55 | 173 | | | 11 | 25 | 10 | -10 | -25 | -15 |
| | 08/00 | 25 | 105 | 95 | 101 | | | 0 | 20 | -10 | 0 | -20 | 5 |
| | 08/06 | 35 | 102 | 79 | 173 | | | 0 | 30 | -14 | 0 | -25 | 15 |
| | 08/12 | 44 | 70 | 87 | | | | 0 | 25 | | 0 | -25 | |
| | 08/18 | 33 | 73 | 99 | | | | 5 | 10 | | -5 | -10 | |
| | 09/00 | 0 | 60 | 58 | | | | 15 | -5 | | -15 | 5 | |
| | 09/06 | 0 | 74 | 86 | | | | 30 | -9 | | -25 | 15 | |
| | 09/12 | 0 | 60 | | | | | 10 | | | -10 | | |
| | 09/18 | 24 | 40 | | | | | -5 | | | 0 | | |
| | 10/00 | 0 | 33 | | | | | -15 | | | 15 | | |
| | 10/06 | 0 | 68 | | | | | -59 | | | 55 | | |
| | 10/12 | 0 | | | | | | | | | | | |
| | 10/18 | 93 | | | | | | | | | | | |
| | 11/00 | 154 | | | | | | | | | | | |
| | 11/06 | 96 | | | | | | | | | | | |
| | mean | 35 | 65 | 80 | 149 | -- | -- | -1 | 14 | -5 | 0 | -12 | 2 |
| | sample | 15 | 11 | 7 | 3 | 0 | 0 | 11 | 7 | 3 | 11 | 7 | 3 |

| Date/Time | | Center Position (km) | | | | | | Central Pressure (hPa) | | | Max. Wind (kt) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (UTC) | T=00 | =24 | =48 | =72 | =96 | =120 | T=24 | =48 | =72 | T=24 | =48 | =72 |
| **TS Bavi (1503)** | | | | | | | | | | | | | |
| Mar. | 11/06 | 25 | 146 | | | | | 2 | | | 0 | | |
| | 11/12 | 80 | 238 | 55 | | | | 2 | -2 | | -5 | 5 | |
| | 11/18 | 0 | 156 | 201 | 114 | 201 | 129 | 2 | 0 | -5 | 0 | 0 | 5 |
| | 12/00 | 55 | 101 | 99 | 134 | 171 | 78 | 0 | 0 | -5 | 0 | 0 | 5 |
| | 12/06 | 33 | 90 | 70 | 123 | 110 | 24 | 0 | 0 | -5 | 0 | 0 | 5 |
| | 12/12 | 44 | 162 | 119 | 141 | 56 | | -2 | 0 | -7 | 5 | 0 | 5 |
| | 12/18 | 49 | 175 | 173 | 16 | 64 | | 0 | -5 | -4 | 0 | 5 | 5 |
| | 13/00 | 77 | 100 | 227 | 81 | 238 | | 0 | -5 | -2 | 0 | 5 | 5 |
| | 13/06 | 0 | 140 | 200 | 162 | 257 | | 0 | -5 | -2 | 0 | 5 | 5 |
| | 13/12 | 60 | 179 | 67 | 201 | | | -5 | -2 | -2 | 5 | 0 | 5 |
| | 13/18 | 79 | 208 | 141 | 225 | | | -5 | -4 | -2 | 5 | 5 | 5 |
| | 14/00 | 45 | 137 | 101 | 207 | | | -5 | -6 | -2 | 5 | 10 | 5 |
| | 14/06 | 60 | 151 | 159 | 271 | | | -5 | -6 | -4 | 5 | 10 | 5 |
| | 14/12 | 0 | 46 | 70 | | | | -7 | -6 | | 5 | 10 | |
| | 14/18 | 66 | 103 | 86 | | | | -4 | -2 | | 5 | 5 | |
| | 15/00 | 88 | 74 | 126 | | | | -6 | -2 | | 10 | 5 | |
| | 15/06 | 22 | 46 | 154 | | | | -4 | -2 | | 10 | 5 | |
| | 15/12 | 112 | 46 | | | | | -2 | | | 5 | | |
| | 15/18 | 173 | 116 | | | | | 0 | | | 5 | | |
| | 16/00 | 45 | 109 | | | | | 0 | | | 0 | | |
| | 16/06 | 35 | 70 | | | | | -2 | | | 0 | | |
| | 16/12 | 78 | | | | | | | | | | | |
| | 16/18 | 93 | | | | | | | | | | | |
| | 17/00 | 24 | | | | | | | | | | | |
| | 17/06 | 0 | | | | | | | | | | | |
| | mean | 54 | 123 | 128 | 152 | 157 | 77 | -2 | -3 | -4 | 3 | 4 | 5 |
| | sample | 25 | 21 | 16 | 11 | 7 | 3 | 21 | 16 | 11 | 21 | 16 | 11 |

| Date/Time | | Center Position (km) | | | | | | Central Pressure (hPa) | | | Max. Wind (kt) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (UTC) | T=00 | =24 | =48 | =72 | =96 | =120 | T=24 | =48 | =72 | T=24 | =48 | =72 |
| **TY Maysak (1504)** | | | | | | | | | | | | | |
| Mar. | 27/18 | 66 | 74 | 31 | 182 | 236 | 341 | 18 | 42 | 60 | -15 | -35 | -45 |
| | 28/00 | 33 | 102 | 111 | 245 | 226 | 246 | 15 | 25 | 40 | -15 | -20 | -25 |
| | 28/06 | 40 | 132 | 143 | 269 | 260 | 256 | 20 | 25 | 45 | -15 | -15 | -25 |
| | 28/12 | 0 | 40 | 55 | 110 | 192 | 195 | 20 | 10 | 35 | -10 | 0 | -15 |
| | 28/18 | 0 | 78 | 74 | 79 | 154 | 210 | 0 | 10 | 25 | 5 | 0 | -10 |
| | 29/00 | 33 | 47 | 104 | 119 | 261 | 322 | 0 | 20 | 25 | 5 | -5 | -10 |
| | 29/06 | 22 | 33 | 113 | 117 | 176 | 203 | 0 | 25 | 25 | 5 | -10 | -10 |
| | 29/12 | 22 | 80 | 104 | 139 | 154 | 138 | 0 | 25 | 25 | 5 | -10 | -10 |
| | 29/18 | 22 | 94 | 102 | 149 | 203 | 146 | 15 | 25 | 25 | -5 | -10 | -10 |
| | 30/00 | 35 | 102 | 120 | 124 | 234 | 278 | 25 | 25 | 10 | -10 | -10 | 0 |
| | 30/06 | 22 | 104 | 135 | 157 | 192 | 292 | 30 | 25 | 0 | -15 | -10 | 5 |
| | 30/12 | 0 | 56 | 109 | 114 | 203 | 305 | 25 | 25 | 0 | -10 | -10 | 5 |
| | 30/18 | 0 | 35 | 89 | 113 | 157 | 275 | 25 | 25 | 10 | -10 | -10 | 0 |
| | 31/00 | 0 | 11 | 73 | 58 | 102 | 145 | 15 | 15 | 15 | -5 | -10 | -15 |
| | 31/06 | 0 | 33 | 77 | 113 | 136 | | 5 | 0 | 10 | 0 | 0 | -10 |
| | 31/12 | 0 | 50 | 122 | 185 | 232 | | -15 | -10 | -5 | 15 | 10 | 5 |
| | 31/18 | 0 | 74 | 95 | 165 | 193 | | 0 | 0 | 0 | 5 | 5 | 0 |
| Apr. | 01/00 | 0 | 25 | 79 | 68 | 74 | | -5 | 0 | 0 | 0 | -5 | 0 |
| | 01/06 | 0 | 35 | 35 | 104 | | | 0 | 5 | -5 | 0 | -5 | 10 |
| | 01/12 | 0 | 32 | 15 | 78 | | | 5 | 10 | -5 | 0 | -5 | 5 |
| | 01/18 | 0 | 34 | 34 | 40 | | | 15 | 15 | -11 | -10 | -10 | 10 |
| | 02/00 | 0 | 24 | 43 | 141 | | | 15 | 10 | -15 | -15 | -10 | 15 |
| | 02/06 | 0 | 34 | 54 | | | | 5 | -10 | | -5 | 10 | |
| | 02/12 | 0 | 31 | 24 | | | | 0 | -15 | | 0 | 15 | |
| | 02/18 | 0 | 24 | 46 | | | | 5 | -16 | | -5 | 20 | |
| | 03/00 | 0 | 44 | 32 | | | | 0 | -20 | | 0 | 20 | |
| | 03/06 | 0 | 31 | | | | | -5 | | | 5 | | |
| | 03/12 | 0 | 33 | | | | | -5 | | | 5 | | |
| | 03/18 | 0 | 81 | | | | | -11 | | | 10 | | |
| | 04/00 | 0 | 128 | | | | | -15 | | | 15 | | |
| | 04/06 | 62 | | | | | | | | | | | |
| | 04/12 | 125 | | | | | | | | | | | |
| | 04/18 | 100 | | | | | | | | | | | |
| | 05/00 | 54 | | | | | | | | | | | |
| | mean | 19 | 57 | 78 | 130 | 188 | 239 | 7 | 11 | 14 | -2 | -4 | -6 |
| | sample | 34 | 30 | 26 | 22 | 18 | 14 | 30 | 26 | 22 | 30 | 26 | 22 |

| Date/Time | | Center Position (km) | | | | | | Central Pressure (hPa) | | | Max. Wind (kt) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (UTC) | T=00 | =24 | =48 | =72 | =96 | =120 | T=24 | =48 | =72 | T=24 | =48 | =72 |
| **TS Haishen (1505)** | | | | | | | | | | | | | |
| Apr. | 04/06 | 16 | 118 | | | | | -8 | | | 15 | | |
| | 04/12 | 40 | | | | | | | | | | | |
| | 04/18 | 80 | | | | | | | | | | | |
| | 05/00 | 35 | | | | | | | | | | | |
| | 05/06 | 11 | | | | | | | | | | | |
| | mean | 36 | 118 | -- | -- | -- | -- | -8 | -- | -- | 15 | -- | -- |
| | sample | 5 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |

| Date/Time | | Center Position (km) | | | | | | Central Pressure (hPa) | | | Max. Wind (kt) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (UTC) | T=00 | =24 | =48 | =72 | =96 | =120 | T=24 | =48 | =72 | T=24 | =48 | =72 |
| **TY Noul (1506)** | | | | | | | | | | | | | |
| May. | 03/18 | 0 | 33 | 55 | 128 | 190 | 131 | -2 | 0 | 15 | 5 | -5 | -15 |
| | 04/00 | 22 | 35 | 86 | 144 | 196 | 230 | 0 | -5 | 10 | 0 | 0 | -10 |
| | 04/06 | 35 | 44 | 118 | 187 | 206 | 147 | -7 | -10 | -5 | 10 | 0 | 0 |
| | 04/12 | 0 | 57 | 128 | 262 | 266 | 141 | -10 | -5 | -5 | 5 | -5 | -5 |
| | 04/18 | 25 | 84 | 149 | 207 | 137 | 68 | -5 | 5 | -5 | -5 | -10 | -5 |
| | 05/00 | 22 | 74 | 153 | 163 | 204 | 110 | -5 | 5 | -5 | -5 | -10 | -5 |
| | 05/06 | 46 | 98 | 201 | 198 | 209 | 158 | 0 | 5 | -5 | -10 | -10 | -5 |
| | 05/12 | 49 | 55 | 109 | 103 | 64 | 11 | 10 | 10 | -5 | -20 | -15 | -5 |
| | 05/18 | 0 | 49 | 88 | 32 | 65 | 46 | 5 | -5 | -30 | -10 | -5 | 10 |
| | 06/00 | 25 | 33 | 55 | 49 | 96 | 100 | 10 | -5 | -30 | -10 | -5 | 10 |
| | 06/06 | 0 | 64 | 55 | 82 | 179 | 256 | 10 | -5 | -20 | -10 | -5 | 5 |
| | 06/12 | 16 | 94 | 140 | 95 | 129 | 343 | 10 | -5 | -15 | -15 | -5 | 5 |
| | 06/18 | 0 | 70 | 60 | 56 | 133 | 467 | 0 | -10 | -5 | -5 | 0 | -5 |
| | 07/00 | 16 | 56 | 119 | 189 | 207 | 772 | -20 | -20 | 20 | 10 | 10 | -20 |
| | 07/06 | 0 | 24 | 99 | 210 | 266 | | -20 | -10 | 30 | 10 | 5 | -30 |
| | 07/12 | 0 | 31 | 78 | 194 | 295 | | -20 | -5 | 40 | 10 | 0 | -35 |
| | 07/18 | 24 | 25 | 74 | 146 | 461 | | -20 | 5 | 45 | 10 | -10 | -35 |
| | 08/00 | 22 | 35 | 89 | 152 | 362 | | -20 | 20 | 30 | 10 | -20 | -25 |
| | 08/06 | 0 | 11 | 39 | 64 | | | -10 | 20 | 15 | 5 | -20 | -15 |
| | 08/12 | 0 | 48 | 105 | 136 | | | -5 | 45 | 0 | 5 | -40 | -10 |
| | 08/18 | 34 | 87 | 84 | 102 | | | 5 | 40 | 0 | -5 | -35 | -10 |
| | 09/00 | 0 | 43 | 66 | 320 | | | 20 | 25 | -5 | -15 | -25 | -10 |
| | 09/06 | 0 | 0 | 46 | | | | 20 | 10 | | -15 | -15 | |
| | 09/12 | 0 | 15 | 161 | | | | 15 | -5 | | -15 | -5 | |
| | 09/18 | 0 | 64 | 326 | | | | 15 | -10 | | -15 | 0 | |
| | 10/00 | 0 | 44 | 399 | | | | 5 | -10 | | -10 | 0 | |
| | 10/06 | 0 | 57 | | | | | -15 | | | 0 | | |
| | 10/12 | 0 | 45 | | | | | -30 | | | 10 | | |
| | 10/18 | 21 | 167 | | | | | -30 | | | 15 | | |
| | 11/00 | 0 | 90 | | | | | -5 | | | -10 | | |
| | 11/06 | 15 | | | | | | | | | | | |
| | 11/12 | 38 | | | | | | | | | | | |
| | 11/18 | 0 | | | | | | | | | | | |
| | 12/00 | 31 | | | | | | | | | | | |
| | mean | 13 | 54 | 119 | 146 | 204 | 213 | -3 | 3 | 3 | -2 | -9 | -10 |
| | sample | 34 | 30 | 26 | 22 | 18 | 14 | 30 | 26 | 22 | 30 | 26 | 22 |

| Date/Time | | Center Position (km) | | | | | | Central Pressure (hPa) | | | Max. Wind (kt) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (UTC) | T=00 | =24 | =48 | =72 | =96 | =120 | T=24 | =48 | =72 | T=24 | =48 | =72 |
| **TY Dolphin (1507)** | | | | | | | | | | | | | |
| May. | 09/12 | 63 | 89 | 212 | 230 | 416 | 534 | 0 | -6 | 0 | 0 | 5 | -5 |
| | 09/18 | 111 | 78 | 128 | 181 | 393 | 404 | 0 | -2 | 0 | 0 | 0 | -5 |
| | 10/00 | 0 | 79 | 94 | 263 | 351 | 364 | 0 | 2 | 10 | 0 | -5 | -15 |
| | 10/06 | 65 | 173 | 115 | 340 | 405 | 400 | 0 | 7 | 15 | 0 | -10 | -20 |
| | 10/12 | 179 | 159 | 133 | 295 | 280 | 301 | 0 | 7 | 15 | 0 | -10 | -20 |
| | 10/18 | 22 | 89 | 208 | 377 | 327 | 374 | -2 | 0 | 5 | 0 | -5 | -10 |
| | 11/00 | 22 | 56 | 263 | 424 | 485 | 560 | 0 | 5 | 0 | -5 | -10 | -5 |
| | 11/06 | 0 | 133 | 427 | 617 | 625 | 697 | 5 | 10 | 0 | -10 | -15 | -5 |
| | 11/12 | 44 | 153 | 340 | 450 | 580 | 688 | 5 | 10 | 0 | -10 | -15 | -5 |
| | 11/18 | 55 | 178 | 337 | 353 | 489 | 529 | -5 | 0 | -10 | 0 | -5 | 5 |
| | 12/00 | 33 | 154 | 284 | 253 | 286 | 297 | 10 | 10 | 15 | -10 | -10 | -15 |
| | 12/06 | 0 | 197 | 335 | 299 | 316 | 326 | 15 | 10 | 15 | -15 | -10 | -15 |
| | 12/12 | 31 | 122 | 216 | 175 | 258 | 253 | 10 | 0 | 5 | -10 | -5 | -5 |
| | 12/18 | 40 | 159 | 166 | 213 | 260 | 317 | 10 | 0 | 20 | -10 | -5 | -15 |
| | 13/00 | 74 | 99 | 81 | 109 | 131 | 154 | 5 | 10 | 20 | -5 | -10 | -20 |
| | 13/06 | 0 | 71 | 88 | 141 | 146 | 144 | -20 | -15 | 5 | 10 | 5 | -10 |
| | 13/12 | 0 | 70 | 68 | 140 | 130 | 94 | -30 | -25 | 5 | 20 | 15 | -5 |
| | 13/18 | 0 | 25 | 78 | 139 | 123 | 93 | -30 | -5 | 5 | 20 | 0 | -5 |
| | 14/00 | 22 | 33 | 87 | 111 | 76 | 38 | -10 | 5 | -5 | 5 | -5 | 0 |
| | 14/06 | 0 | 55 | 86 | 121 | 106 | 63 | -10 | 15 | -5 | 5 | -10 | 0 |
| | 14/12 | 0 | 68 | 34 | 71 | 31 | 112 | -10 | 5 | -5 | 5 | -5 | 0 |
| | 14/18 | 0 | 22 | 21 | 31 | 15 | 159 | 5 | 5 | -5 | -5 | -5 | 0 |
| | 15/00 | 0 | 62 | 98 | 149 | 234 | 196 | 5 | -5 | -15 | -5 | 0 | 5 |
| | 15/06 | 0 | 62 | 100 | 155 | 255 | 232 | 15 | -5 | -25 | -10 | 0 | 15 |
| | 15/12 | 0 | 32 | 15 | 21 | 113 | 587 | 15 | -5 | -25 | -10 | 0 | 15 |
| | 15/18 | 0 | 22 | 25 | 10 | 126 | 462 | 10 | -5 | -30 | -10 | 0 | 20 |
| | 16/00 | 0 | 15 | 38 | 75 | 146 | | -5 | -25 | -30 | 0 | 10 | 20 |
| | 16/06 | 0 | 11 | 38 | 75 | 118 | | -15 | -35 | -35 | 5 | 20 | 25 |
| | 16/12 | 0 | 25 | 31 | 39 | 270 | | -20 | -35 | -35 | 10 | 20 | 25 |
| | 16/18 | 0 | 33 | 33 | 91 | 381 | | -20 | -35 | -35 | 10 | 25 | 30 |
| | 17/00 | 0 | 21 | 20 | 81 | | | -20 | -25 | -25 | 10 | 15 | 20 |
| | 17/06 | 0 | 15 | 39 | 97 | | | -30 | -30 | -20 | 20 | 20 | 15 |
| | 17/12 | 0 | 10 | 93 | 355 | | | -30 | -30 | -20 | 20 | 20 | 20 |
| | 17/18 | 0 | 10 | 146 | 406 | | | -30 | -30 | -15 | 20 | 20 | 15 |
| | 18/00 | 42 | 11 | 126 | | | | -15 | -10 | | 10 | 10 | |
| | 18/06 | 21 | 38 | 63 | | | | -5 | -5 | | 5 | 5 | |
| | 18/12 | 0 | 35 | 124 | | | | 0 | -10 | | 0 | 10 | |
| | 18/18 | 44 | 70 | 142 | | | | 0 | -5 | | 0 | 5 | |
| | 19/00 | 33 | 59 | | | | | 5 | | | -5 | | |
| | 19/06 | 0 | 33 | | | | | 0 | | | 0 | | |
| | 19/12 | 0 | 36 | | | | | -5 | | | 5 | | |
| | 19/18 | 22 | 45 | | | | | 0 | | | -5 | | |
| | 20/00 | 0 | | | | | | | | | | | |
| | 20/06 | 36 | | | | | | | | | | | |
| | 20/12 | 22 | | | | | | | | | | | |
| | 20/18 | 0 | | | | | | | | | | | |
| | mean | 21 | 69 | 130 | 203 | 262 | 322 | -5 | -6 | -6 | 1 | 2 | 1 |
| | sample | 46 | 42 | 38 | 34 | 30 | 26 | 42 | 38 | 34 | 42 | 38 | 34 |

| Date/Time | | Center Position (km) | | | | | | Central Pressure (hPa) | | | Max. Wind (kt) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (UTC) | T=00 | =24 | =48 | =72 | =96 | =120 | T=24 | =48 | =72 | T=24 | =48 | =72 |
| **TS Kujira (1508)** | | | | | | | | | | | | | |
| Jun. | 21/00 | 68 | 25 | 170 | 307 | | | 9 | 4 | 13 | 0 | 10 | -20 |
| | 21/06 | 0 | 39 | 195 | 348 | | | 7 | 2 | 8 | 0 | 5 | -15 |
| | 21/12 | 39 | 139 | 281 | 310 | | | 0 | 4 | 6 | 0 | -5 | -10 |
| | 21/18 | 64 | 184 | 288 | | | | -5 | 8 | | 10 | -5 | |
| | 22/00 | 61 | 150 | 262 | | | | 0 | 15 | | 5 | -20 | |
| | 22/06 | 21 | 166 | 196 | | | | 0 | 10 | | 0 | -15 | |
| | 22/12 | 94 | 189 | 196 | | | | -5 | 6 | | 0 | -10 | |
| | 22/18 | 119 | 182 | | | | | 2 | | | -5 | | |
| | 23/00 | 85 | 115 | | | | | 5 | | | -10 | | |
| | 23/06 | 39 | 126 | | | | | 0 | | | -5 | | |
| | 23/12 | 25 | 33 | | | | | -2 | | | 0 | | |
| | 23/18 | 31 | | | | | | | | | | | |
| | 24/00 | 47 | | | | | | | | | | | |
| | 24/06 | 15 | | | | | | | | | | | |
| | 24/12 | 22 | | | | | | | | | | | |
| | mean | 49 | 123 | 227 | 322 | -- | -- | 1 | 7 | 9 | 0 | -6 | -15 |
| | sample | 15 | 11 | 7 | 3 | 0 | 0 | 11 | 7 | 3 | 11 | 7 | 3 |

| Date/Time | | Center Position (km) | | | | | | Central Pressure (hPa) | | | Max. Wind (kt) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (UTC) | T=00 | =24 | =48 | =72 | =96 | =120 | T=24 | =48 | =72 | T=24 | =48 | =72 |
| **TY Chan-hom (1509)** | | | | | | | | | | | | | |
| Jun. | 30/12 | 114 | 188 | 572 | 230 | 126 | 144 | 10 | 16 | 0 | -10 | -15 | 0 |
| | 30/18 | 141 | 222 | 485 | 69 | 173 | 343 | 11 | 10 | -10 | -10 | -10 | 10 |
| Jul. | 01/00 | 142 | 94 | 181 | 252 | 341 | 436 | 9 | 5 | -15 | -5 | 0 | 20 |
| | 01/06 | 164 | 172 | 144 | 176 | 295 | 283 | 9 | 0 | -15 | -5 | 5 | 20 |
| | 01/12 | 77 | 211 | 208 | 173 | 349 | 368 | 0 | -15 | -25 | 0 | 15 | 25 |
| | 01/18 | 40 | 178 | 295 | 131 | 343 | 354 | -10 | -25 | -30 | 10 | 25 | 30 |
| | 02/00 | 24 | 95 | 141 | 198 | 149 | 304 | -15 | -30 | -40 | 15 | 30 | 35 |
| | 02/06 | 25 | 57 | 97 | 185 | 90 | 318 | -20 | -30 | -40 | 20 | 30 | 35 |
| | 02/12 | 22 | 47 | 68 | 175 | 300 | 601 | -20 | -40 | -55 | 25 | 40 | 50 |
| | 02/18 | 40 | 143 | 74 | 119 | 320 | 580 | -40 | -45 | -50 | 40 | 45 | 45 |
| | 03/00 | 45 | 62 | 113 | 147 | 289 | 424 | -15 | -30 | -30 | 15 | 30 | 30 |
| | 03/06 | 55 | 39 | 114 | 79 | 350 | 534 | -15 | -30 | -30 | 15 | 30 | 30 |
| | 03/12 | 44 | 136 | 54 | 134 | 345 | 396 | -10 | -25 | -30 | 10 | 25 | 30 |
| | 03/18 | 78 | 141 | 78 | 220 | 352 | 359 | -10 | -20 | -25 | 10 | 20 | 25 |
| | 04/00 | 49 | 142 | 88 | 261 | 373 | 509 | -10 | -15 | -20 | 10 | 15 | 20 |
| | 04/06 | 39 | 70 | 135 | 253 | 359 | 483 | -10 | -15 | -15 | 10 | 15 | 15 |
| | 04/12 | 16 | 70 | 24 | 177 | 230 | 206 | -10 | -15 | -15 | 10 | 15 | 15 |
| | 04/18 | 55 | 39 | 91 | 172 | 162 | 111 | -5 | -10 | -15 | 5 | 10 | 15 |
| | 05/00 | 31 | 54 | 44 | 101 | 241 | 355 | 0 | -5 | -15 | 0 | 5 | 10 |
| | 05/06 | 46 | 74 | 77 | 111 | 270 | 366 | 0 | 5 | -5 | 0 | -5 | 0 |
| | 05/12 | 43 | 31 | 49 | 84 | 143 | 317 | 0 | 5 | -5 | 0 | -5 | 0 |
| | 05/18 | 25 | 0 | 39 | 108 | 165 | 236 | 0 | 0 | -10 | 0 | 0 | 5 |
| | 06/00 | 25 | 55 | 25 | 63 | 152 | 326 | 0 | -15 | -25 | 0 | 10 | 20 |
| | 06/06 | 72 | 25 | 25 | 75 | 153 | 357 | 0 | -20 | -30 | 0 | 15 | 20 |
| | 06/12 | 34 | 11 | 33 | 97 | 168 | 471 | -10 | -30 | -15 | 10 | 20 | 10 |
| | 06/18 | 15 | 15 | 41 | 113 | 266 | 656 | -15 | -40 | -10 | 15 | 30 | 10 |
| | 07/00 | 35 | 31 | 47 | 106 | 364 | 1052 | -15 | -40 | -10 | 15 | 30 | 10 |
| | 07/06 | 33 | 38 | 88 | 146 | 397 | 1138 | -20 | -35 | -5 | 10 | 15 | 0 |
| | 07/12 | 31 | 43 | 81 | 204 | 440 | 1011 | -25 | -20 | -5 | 15 | 5 | 0 |
| | 07/18 | 15 | 43 | 97 | 232 | 588 | 1174 | -35 | -10 | -5 | 20 | 0 | 0 |
| | 08/00 | 22 | 31 | 122 | 336 | 672 | | -30 | 0 | 0 | 15 | -5 | 0 |
| | 08/06 | 24 | 41 | 146 | 346 | 760 | | -25 | 0 | -10 | 10 | -5 | 5 |
| | 08/12 | 0 | 61 | 140 | 292 | 780 | | -5 | 0 | 10 | 0 | 0 | -10 |
| | 08/18 | 0 | 74 | 140 | 355 | 898 | | 15 | 15 | 10 | -10 | -10 | -5 |
| | 09/00 | 0 | 91 | 152 | 388 | | | 20 | 20 | 10 | -15 | -15 | -5 |
| | 09/06 | 0 | 92 | 143 | 521 | | | 20 | 15 | 5 | -15 | -15 | 0 |
| | 09/12 | 0 | 92 | 230 | 567 | | | 5 | 5 | -5 | 0 | -5 | 5 |
| | 09/18 | 10 | 86 | 262 | 577 | | | -10 | 5 | 0 | 5 | 0 | 10 |
| | 10/00 | 0 | 90 | 256 | | | | -5 | 0 | | 5 | 5 | |
| | 10/06 | 0 | 103 | 319 | | | | -10 | -5 | | 5 | 10 | |
| | 10/12 | 0 | 106 | 324 | | | | 0 | -10 | | 0 | 15 | |
| | 10/18 | 10 | 159 | 288 | | | | 0 | -5 | | 5 | 15 | |
| | 11/00 | 15 | 114 | | | | | -5 | | | 10 | | |
| | 11/06 | 10 | 107 | | | | | -5 | | | 10 | | |
| | 11/12 | 10 | 62 | | | | | -5 | | | 10 | | |
| | 11/18 | 24 | 102 | | | | | -5 | | | 5 | | |
| | 12/00 | 22 | | | | | | | | | | | |
| | 12/06 | 0 | | | | | | | | | | | |
| | 12/12 | 29 | | | | | | | | | | | |
| | 12/18 | 0 | | | | | | | | | | | |
| | mean | 35 | 86 | 146 | 210 | 335 | 474 | -7 | -11 | -15 | 6 | 10 | 14 |
| | sample | 50 | 46 | 42 | 38 | 34 | 30 | 46 | 42 | 38 | 46 | 42 | 38 |

| Date/Time | | Center Position (km) | | | | | | Central Pressure (hPa) | | | Max. Wind (kt) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (UTC) | T=00 | =24 | =48 | =72 | =96 | =120 | T=24 | =48 | =72 | T=24 | =48 | =72 |
| **STS Linfa (1510)** | | | | | | | | | | | | | |
| Jul. | 02/12 | 99 | 201 | 149 | 326 | 357 | 424 | 4 | 0 | -12 | 0 | 10 | 20 |
| | 02/18 | 134 | 163 | 140 | 301 | 315 | 365 | 4 | 0 | -12 | 0 | 10 | 20 |
| | 03/00 | 44 | 69 | 85 | 181 | 376 | 364 | 4 | -5 | -7 | 0 | 15 | 15 |
| | 03/06 | 25 | 46 | 154 | 164 | 254 | 252 | -5 | -22 | -27 | 10 | 25 | 30 |
| | 03/12 | 44 | 118 | 262 | 171 | 263 | 350 | -5 | -17 | -22 | 10 | 20 | 25 |
| | 03/18 | 78 | 54 | 223 | 214 | 283 | 429 | -5 | -17 | -20 | 10 | 20 | 25 |
| | 04/00 | 99 | 42 | 194 | 261 | 304 | 516 | -15 | -17 | -20 | 20 | 20 | 25 |
| | 04/06 | 0 | 222 | 233 | 382 | 434 | 783 | -17 | -17 | -15 | 20 | 20 | 20 |
| | 04/12 | 21 | 222 | 202 | 347 | 412 | 842 | -17 | -22 | -15 | 20 | 25 | 20 |
| | 04/18 | 0 | 201 | 210 | 324 | 445 | 946 | -17 | -20 | -15 | 20 | 25 | 20 |
| | 05/00 | 21 | 154 | 230 | 300 | 488 | | -7 | -10 | 0 | 15 | 20 | 10 |
| | 05/06 | 0 | 107 | 254 | 280 | 598 | | -2 | 0 | 0 | 5 | 5 | 5 |
| | 05/12 | 42 | 63 | 239 | 290 | 710 | | -2 | 0 | 0 | 5 | 5 | 5 |
| | 05/18 | 33 | 87 | 166 | 282 | 752 | | -5 | -5 | 0 | 10 | 10 | 5 |
| | 06/00 | 25 | 96 | 145 | 310 | | | -5 | 0 | 0 | 10 | 5 | 5 |
| | 06/06 | 15 | 99 | 155 | 416 | | | 0 | 10 | 9 | 5 | -5 | -10 |
| | 06/12 | 15 | 94 | 126 | 463 | | | 0 | 10 | 2 | 5 | -5 | -5 |
| | 06/18 | 24 | 122 | 206 | 609 | | | 0 | 10 | -2 | 5 | -5 | 0 |
| | 07/00 | 0 | 25 | 112 | | | | 0 | 10 | | 0 | -10 | |
| | 07/06 | 0 | 35 | 200 | | | | 0 | 5 | | 0 | -10 | |
| | 07/12 | 33 | 39 | 204 | | | | -5 | -2 | | 0 | -5 | |
| | 07/18 | 0 | 53 | 229 | | | | -5 | -6 | | 0 | 0 | |
| | 08/00 | 0 | 59 | | | | | -5 | | | 0 | | |
| | 08/06 | 0 | 113 | | | | | -10 | | | 5 | | |
| | 08/12 | 0 | 164 | | | | | -12 | | | 5 | | |
| | 08/18 | 0 | 128 | | | | | -11 | | | 5 | | |
| | 09/00 | 15 | | | | | | | | | | | |
| | 09/06 | 0 | | | | | | | | | | | |
| | 09/12 | 0 | | | | | | | | | | | |
| | 09/18 | 0 | | | | | | | | | | | |
| | mean | 26 | 107 | 187 | 312 | 428 | 527 | -5 | -5 | -9 | 7 | 9 | 13 |
| | sample | 30 | 26 | 22 | 18 | 14 | 10 | 26 | 22 | 18 | 26 | 22 | 18 |

| Date/Time | | Center Position (km) | | | | | | Central Pressure (hPa) | | | Max. Wind (kt) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (UTC) | T=00 | =24 | =48 | =72 | =96 | =120 | T=24 | =48 | =72 | T=24 | =48 | =72 |
| **TY Nangka (1511)** | | | | | | | | | | | | | |
| Jul. | 03/18 | 55 | 80 | 31 | 43 | 109 | 217 | 4 | 12 | 30 | -5 | -10 | -25 |
| | 04/00 | 0 | 90 | 71 | 111 | 112 | 246 | 2 | 10 | 35 | 0 | -10 | -30 |
| | 04/06 | 25 | 57 | 140 | 124 | 168 | 271 | 2 | 15 | 45 | 0 | -10 | -35 |
| | 04/12 | 0 | 101 | 110 | 141 | 234 | 347 | 5 | 15 | 45 | -5 | -10 | -35 |
| | 04/18 | 60 | 67 | 92 | 151 | 230 | 315 | 0 | 15 | 35 | 0 | -10 | -25 |
| | 05/00 | 11 | 62 | 46 | 140 | 203 | 344 | 0 | 20 | 20 | 0 | -15 | -10 |
| | 05/06 | 16 | 64 | 63 | 217 | 245 | 375 | 5 | 30 | 15 | 0 | -20 | -5 |
| | 05/12 | 25 | 22 | 33 | 175 | 292 | 501 | 10 | 40 | 15 | -5 | -30 | -5 |
| | 05/18 | 83 | 16 | 73 | 193 | 349 | 587 | 15 | 35 | 20 | -10 | -25 | -10 |
| | 06/00 | 0 | 55 | 185 | 223 | 348 | 629 | 20 | 25 | 15 | -15 | -15 | -10 |
| | 06/06 | 0 | 0 | 148 | 199 | 361 | 689 | 25 | 15 | 15 | -15 | -5 | -10 |
| | 06/12 | 0 | 40 | 85 | 176 | 329 | 639 | 30 | 10 | 15 | -20 | -5 | -10 |
| | 06/18 | 0 | 46 | 123 | 192 | 320 | 610 | 15 | 0 | 0 | -10 | 0 | 0 |
| | 07/00 | 0 | 63 | 79 | 161 | 290 | 612 | -5 | -10 | -10 | 5 | 5 | 5 |
| | 07/06 | 16 | 46 | 91 | 185 | 359 | 662 | -15 | -10 | -15 | 10 | 5 | 10 |
| | 07/12 | 0 | 64 | 121 | 230 | 432 | 579 | -15 | -10 | -20 | 10 | 5 | 15 |
| | 07/18 | 0 | 79 | 129 | 211 | 403 | 502 | -10 | -10 | -25 | 5 | 5 | 20 |
| | 08/00 | 0 | 31 | 119 | 185 | 450 | 519 | -5 | -5 | -20 | 0 | 0 | 15 |
| | 08/06 | 0 | 11 | 91 | 178 | 526 | 641 | 5 | 0 | -15 | -5 | 0 | 10 |
| | 08/12 | 11 | 78 | 106 | 154 | 511 | 557 | 5 | -5 | -20 | -5 | 5 | 15 |
| | 08/18 | 0 | 77 | 101 | 211 | 519 | 464 | -5 | -20 | -30 | 0 | 15 | 20 |
| | 09/00 | 11 | 85 | 144 | 278 | 380 | 298 | 0 | -20 | -30 | -5 | 15 | 20 |
| | 09/06 | 0 | 105 | 174 | 331 | 320 | 144 | -5 | -25 | -30 | 0 | 15 | 20 |
| | 09/12 | 11 | 119 | 167 | 334 | 384 | 185 | -10 | -30 | -40 | 10 | 20 | 30 |
| | 09/18 | 0 | 69 | 143 | 308 | 349 | 97 | -15 | -30 | -40 | 15 | 20 | 30 |
| | 10/00 | 0 | 61 | 167 | 244 | 265 | 161 | -15 | -35 | -40 | 15 | 25 | 30 |
| | 10/06 | 0 | 70 | 210 | 255 | 191 | 256 | -20 | -35 | -35 | 15 | 25 | 25 |
| | 10/12 | 0 | 46 | 201 | 174 | 71 | 380 | -25 | -40 | -30 | 20 | 30 | 20 |
| | 10/18 | 0 | 39 | 168 | 117 | 161 | 426 | -15 | -30 | -25 | 15 | 25 | 20 |
| | 11/00 | 0 | 64 | 109 | 93 | 157 | 388 | -10 | -25 | -25 | 10 | 25 | 20 |
| | 11/06 | 0 | 57 | 106 | 116 | 80 | 144 | -5 | -20 | -25 | 5 | 20 | 20 |
| | 11/12 | 0 | 77 | 135 | 81 | 140 | 218 | -15 | -15 | -25 | 10 | 15 | 20 |
| | 11/18 | 34 | 77 | 161 | 83 | 211 | 341 | -15 | -15 | -20 | 10 | 15 | 15 |
| | 12/00 | 11 | 54 | 125 | 20 | 174 | 268 | -25 | -20 | -20 | 20 | 15 | 15 |
| | 12/06 | 0 | 57 | 111 | 10 | 135 | 230 | -20 | -20 | -20 | 15 | 15 | 15 |
| | 12/12 | 0 | 43 | 52 | 30 | 60 | | -15 | -25 | -15 | 15 | 20 | 10 |
| | 12/18 | 0 | 69 | 54 | 66 | 21 | | -15 | -20 | -15 | 10 | 15 | 10 |
| | 13/00 | 0 | 43 | 10 | 135 | 195 | | -15 | -20 | -20 | 10 | 10 | 15 |
| | 13/06 | 0 | 42 | 15 | 169 | 190 | | -15 | -20 | -25 | 10 | 10 | 20 |
| | 13/12 | 0 | 32 | 56 | 115 | | | -10 | -15 | -10 | 10 | 10 | 10 |
| | 13/18 | 0 | 15 | 68 | 122 | | | -10 | -15 | -15 | 5 | 10 | 10 |
| | 14/00 | 0 | 67 | 156 | 191 | | | -10 | -20 | -30 | 5 | 15 | 20 |
| | 14/06 | 10 | 39 | 135 | 162 | | | -5 | -15 | -19 | 0 | 10 | 25 |
| | 14/12 | 11 | 97 | 183 | | | | -5 | -15 | | 0 | 10 | |
| | 14/18 | 0 | 77 | 146 | | | | -10 | -15 | | 5 | 10 | |
| | 15/00 | 0 | 73 | 124 | | | | -10 | -20 | | 10 | 15 | |
| | 15/06 | 11 | 72 | 96 | | | | -10 | -14 | | 10 | 20 | |
| | 15/12 | 0 | 44 | | | | | -5 | | | 5 | | |
| | 15/18 | 15 | 50 | | | | | -5 | | | 5 | | |
| | 16/00 | 10 | 27 | | | | | -10 | | | 5 | | |
| | 16/06 | 0 | 35 | | | | | -9 | | | 15 | | |
| | 16/12 | 0 | | | | | | | | | | | |
| | 16/18 | 0 | | | | | | | | | | | |
| | 17/00 | 0 | | | | | | | | | | | |
| | 17/06 | 9 | | | | | | | | | | | |
| | mean | 8 | 58 | 112 | 164 | 263 | 396 | -5 | -9 | -9 | 4 | 7 | 7 |
| | sample | 55 | 51 | 47 | 43 | 39 | 35 | 51 | 47 | 43 | 51 | 47 | 43 |

| Date/Time | | Center Position (km) | | | | | | Central Pressure (hPa) | | | Max. Wind (kt) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (UTC) | T=00 | =24 | =48 | =72 | =96 | =120 | T=24 | =48 | =72 | T=24 | =48 | =72 |
| **TY Halola (1512)** | | | | | | | | | | | | | |
| Jul. | 13/00 | 22 | 144 | 213 | 207 | | | 10 | 0 | -20 | -10 | -5 | 15 |
| | 13/06 | 22 | 180 | 359 | 353 | | | 15 | -5 | -25 | -15 | 0 | 20 |
| | 13/12 | 32 | 161 | 247 | 131 | | | 10 | -5 | -31 | -15 | 0 | 30 |
| | 13/18 | 22 | 116 | 202 | 61 | | | 0 | -10 | -35 | -5 | 5 | 35 |
| | 14/00 | 0 | 126 | 169 | | | | -10 | -25 | | 5 | 20 | |
| | 14/06 | 22 | 105 | 131 | | | | -15 | -30 | | 10 | 25 | |
| | 14/12 | 33 | 120 | 24 | | | | -15 | -36 | | 10 | 35 | |
| | 14/18 | 0 | 101 | 25 | | | 353 | -20 | -40 | | 15 | 40 | |
| | 15/00 | 0 | 89 | | | | 266 | -25 | | | 20 | | |
| | 15/06 | 54 | 64 | | | | 257 | -30 | | | 25 | | |
| | 15/12 | 31 | 85 | | | | 248 | -36 | | | 35 | | |
| | 15/18 | 56 | 87 | | | 122 | 285 | -40 | | | 40 | | |
| | 16/00 | 0 | | | | 127 | 210 | | | | | | |
| | 16/06 | 39 | | | | 118 | 283 | | | | | | |
| | 16/12 | 138 | | | | 198 | 272 | | | | | | |
| | 16/18 | 234 | | | 244 | 221 | 334 | | | -20 | | | 25 |
| | 17/00 | | | | | | | | | | | | |
| | 17/06 | | | | | | | | | | | | |
| | 17/12 | | | | | | | | | | | | |
| | 17/18 | | | | | | | | | | | | |
| | 18/00 | | | | | | | | | | | | |
| | 18/06 | | | | | | | | | | | | |
| | 18/12 | | | | | | | | | | | | |
| | 18/18 | | | | | | | | | | | | |
| | 19/00 | | | | | | | | | | | | |
| | 19/06 | | | | | | | | | | | | |
| | 19/12 | | | | | | | | | | | | |
| | 19/18 | 31 | 74 | | | | | 15 | | | -20 | | |
| | 20/00 | 21 | 57 | 30 | 168 | 567 | 1073 | 23 | 39 | 25 | -25 | -35 | -25 |
| | 20/06 | 0 | 35 | 35 | 206 | 685 | 1110 | 10 | 20 | 15 | -15 | -20 | -20 |
| | 20/12 | 0 | 33 | 75 | 200 | 676 | 960 | 15 | 20 | 15 | -20 | -20 | -20 |
| | 20/18 | 22 | 39 | 69 | 209 | 522 | 724 | 25 | 25 | 20 | -20 | -20 | -20 |
| | 21/00 | 0 | 24 | 32 | 113 | 341 | 567 | 10 | 0 | 5 | -10 | -5 | -10 |
| | 21/06 | 0 | 31 | 75 | 203 | 354 | 813 | 0 | -10 | 0 | -5 | 0 | -5 |
| | 21/12 | 0 | 24 | 105 | 231 | 448 | | -5 | -10 | -5 | 0 | 0 | 0 |
| | 21/18 | 0 | 23 | 127 | 231 | 498 | | -5 | -5 | -5 | 0 | 0 | 0 |
| | 22/00 | 0 | 33 | 82 | 186 | 248 | | -10 | -5 | -5 | 5 | 0 | 0 |
| | 22/06 | 0 | 30 | 122 | 148 | 243 | | -10 | -5 | -5 | 5 | 0 | 0 |
| | 22/12 | 0 | 46 | 102 | 113 | | | -10 | -5 | -5 | 5 | 5 | 5 |
| | 22/18 | 0 | 54 | 117 | 152 | | | -10 | -10 | 0 | 5 | 10 | 0 |
| | 23/00 | 0 | 52 | 134 | 231 | | | -10 | -10 | -5 | 5 | 10 | 5 |
| | 23/06 | 0 | 60 | 150 | 264 | | | -10 | -10 | -9 | 5 | 10 | 10 |
| | 23/12 | 0 | 40 | 128 | | | | -5 | -15 | | 5 | 15 | |
| | 23/18 | 0 | 71 | 152 | | | | -10 | -5 | | 10 | 5 | |
| | 24/00 | 22 | 15 | 154 | | | | -10 | -15 | | 10 | 15 | |
| | 24/06 | 0 | 60 | 161 | | | | -10 | -9 | | 10 | 10 | |
| | 24/12 | 0 | 79 | | | | | -15 | | | 10 | | |
| | 24/18 | 0 | 88 | | | | | -5 | | | 0 | | |
| | 25/00 | 0 | 76 | | | | | -10 | | | 5 | | |
| | 25/06 | 0 | 85 | | | | | -9 | | | 5 | | |
| | 25/12 | 10 | | | | | | | | | | | |
| | 25/18 | 22 | | | | | | | | | | | |
| | 26/00 | 0 | | | | | | | | | | | |
| | 26/06 | 58 | | | | | | | | | | | |
| | mean | 21 | 72 | 124 | 192 | 358 | 517 | -6 | -6 | -5 | 2 | 4 | 2 |
| | sample | 43 | 35 | 26 | 19 | 15 | 15 | 35 | 26 | 19 | 35 | 26 | 19 |

| Date/Time | | Center Position (km) | | | | | | Central Pressure (hPa) | | | Max. Wind (kt) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (UTC) | T=00 | =24 | =48 | =72 | =96 | =120 | T=24 | =48 | =72 | T=24 | =48 | =72 |
| **TY Soudelor (1513)** | | | | | | | | | | | | | |
| Aug. | 01/06 | 22 | 63 | 91 | 49 | 76 | 94 | 20 | 50 | 65 | -20 | -35 | -40 |
| | 01/12 | 15 | 39 | 68 | 109 | 228 | 356 | 25 | 65 | 50 | -25 | -40 | -30 |
| | 01/18 | 0 | 21 | 112 | 128 | 247 | 354 | 35 | 70 | 30 | -25 | -45 | -20 |
| | 02/00 | 0 | 72 | 137 | 131 | 148 | 155 | 30 | 55 | 10 | -20 | -35 | -5 |
| | 02/06 | 0 | 119 | 133 | 176 | 236 | 268 | 25 | 40 | 0 | -15 | -25 | 0 |
| | 02/12 | 0 | 61 | 64 | 104 | 149 | 209 | 40 | 25 | -10 | -20 | -10 | 10 |
| | 02/18 | 0 | 49 | 59 | 130 | 194 | 194 | 25 | -10 | -25 | -15 | 5 | 15 |
| | 03/00 | 0 | 89 | 68 | 84 | 124 | 204 | 25 | -15 | -25 | -15 | 10 | 15 |
| | 03/06 | 0 | 79 | 137 | 180 | 206 | 274 | 20 | -15 | -25 | -15 | 10 | 15 |
| | 03/12 | 0 | 85 | 157 | 159 | 154 | 180 | 5 | -25 | -25 | 0 | 15 | 15 |
| | 03/18 | 15 | 46 | 43 | 52 | 39 | 112 | -25 | -25 | -20 | 15 | 15 | 15 |
| | 04/00 | 0 | 62 | 74 | 66 | 102 | 52 | -30 | -25 | -20 | 20 | 15 | 15 |
| | 04/06 | 0 | 54 | 25 | 35 | 22 | 100 | -30 | -25 | -20 | 20 | 15 | 15 |
| | 04/12 | 0 | 24 | 15 | 49 | 72 | | -30 | -25 | -20 | 20 | 15 | 15 |
| | 04/18 | 0 | 0 | 33 | 118 | 98 | | -5 | -10 | 0 | 5 | 10 | 5 |
| | 05/00 | 0 | 21 | 63 | 107 | 83 | | 0 | -15 | -15 | 0 | 10 | 10 |
| | 05/06 | 0 | 57 | 66 | 71 | 126 | | 0 | -15 | -15 | 0 | 10 | 5 |
| | 05/12 | 0 | 66 | 83 | 92 | | | -5 | -10 | -10 | 0 | 5 | 5 |
| | 05/18 | 0 | 47 | 150 | 106 | | | -5 | 10 | -15 | 0 | -5 | 15 |
| | 06/00 | 0 | 52 | 84 | 122 | | | -5 | -15 | -12 | 0 | 15 | 15 |
| | 06/06 | 21 | 56 | 51 | 83 | | | -5 | -20 | -9 | 0 | 15 | 15 |
| | 06/12 | 0 | 62 | 60 | | | | -5 | -10 | | 0 | 5 | |
| | 06/18 | 0 | 112 | 69 | | | | -5 | -5 | | 0 | 5 | |
| | 07/00 | 0 | 10 | 60 | | | | -10 | -7 | | 5 | 10 | |
| | 07/06 | 15 | 33 | 73 | | | | -5 | -4 | | 0 | 10 | |
| | 07/12 | 0 | 56 | | | | | -5 | | | 0 | | |
| | 07/18 | 0 | 69 | | | | | -5 | | | 5 | | |
| | 08/00 | 46 | 112 | | | | | -7 | | | 10 | | |
| | 08/06 | 0 | 70 | | | | | -4 | | | 10 | | |
| | 08/12 | 45 | | | | | | | | | | | |
| | 08/18 | 24 | | | | | | | | | | | |
| | 09/00 | 15 | | | | | | | | | | | |
| | 09/06 | 54 | | | | | | | | | | | |
| | 09/12 | | | | | | | | | | | | |
| | mean | 8 | 58 | 79 | 102 | 135 | 196 | 2 | 2 | -5 | -2 | 0 | 5 |
| | sample | 33 | 29 | 25 | 21 | 17 | 13 | 29 | 25 | 21 | 29 | 25 | 21 |

| Date/Time | | Center Position (km) | | | | | | Central Pressure (hPa) | | | Max. Wind (kt) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (UTC) | T=00 | =24 | =48 | =72 | =96 | =120 | T=24 | =48 | =72 | T=24 | =48 | =72 |
| **TS Molave (1514)** | | | | | | | | | | | | | |
| Aug. | 07/06 | 0 | 90 | | | | | 8 | | | -5 | | |
| | 07/12 | 45 | 90 | 63 | 62 | 194 | 560 | 6 | 2 | 2 | 0 | 5 | 5 |
| | 07/18 | 81 | 87 | 15 | 44 | 210 | 527 | 0 | 0 | 5 | 5 | 5 | 0 |
| | 08/00 | 15 | 132 | 73 | 145 | 322 | 612 | 0 | 0 | 5 | 5 | 5 | 0 |
| | 08/06 | 24 | 94 | 40 | 109 | 400 | 723 | -5 | -10 | -5 | 10 | 15 | 10 |
| | 08/12 | 32 | 51 | 10 | 35 | 456 | 629 | -5 | -10 | -5 | 10 | 15 | 10 |
| | 08/18 | 45 | 40 | 29 | 9 | 322 | 547 | -5 | -5 | -15 | 10 | 10 | 20 |
| | 09/00 | 37 | 29 | 35 | 89 | 36 | | -5 | -5 | -15 | 10 | 10 | 20 |
| | 09/06 | 15 | 15 | 67 | 107 | 56 | | -10 | -10 | -15 | 15 | 15 | 20 |
| | 09/12 | 24 | 10 | 91 | 56 | 154 | | -5 | -5 | -15 | 10 | 10 | 20 |
| | 09/18 | 10 | 22 | 69 | 35 | 154 | | 0 | -10 | -15 | 5 | 15 | 20 |
| | 10/00 | 0 | 35 | 59 | 24 | | | 0 | -10 | -15 | 5 | 15 | 20 |
| | 10/06 | 11 | 22 | 48 | 63 | | | 0 | -10 | -15 | 5 | 15 | 20 |
| | 10/12 | 0 | 15 | 93 | 154 | | | 0 | -10 | -10 | 5 | 15 | 15 |
| | 10/18 | 0 | 39 | 141 | 156 | | | -5 | -10 | -10 | 10 | 15 | 15 |
| | 11/00 | 15 | 72 | 78 | | | | -5 | -10 | | 10 | 15 | |
| | 11/06 | 0 | 22 | 80 | | | | -5 | -10 | | 10 | 10 | |
| | 11/12 | 15 | 57 | 50 | | | | -5 | -10 | | 10 | 10 | |
| | 11/18 | 28 | 62 | 75 | | | | 0 | -5 | | 5 | 10 | |
| | 12/00 | 48 | 80 | | | | | 0 | | | 5 | | |
| | 12/06 | 35 | 72 | | | | | 0 | | | 5 | | |
| | 12/12 | 22 | 98 | | | | | -5 | | | 5 | | |
| | 12/18 | 22 | 146 | | | | | -5 | | | 5 | | |
| | 13/00 | 0 | | | | | | | | | | | |
| | 13/06 | 0 | | | | | | | | | | | |
| | 13/12 | 44 | | | | | | | | | | | |
| | 13/18 | 82 | | | | | | | | | | | |
| | mean | 24 | 60 | 62 | 78 | 231 | 600 | -2 | -7 | -9 | 7 | 12 | 14 |
| | sample | 27 | 23 | 18 | 14 | 10 | 6 | 23 | 18 | 14 | 23 | 18 | 14 |

| Date/Time | | Center Position (km) | | | | | | Central Pressure (hPa) | | | Max. Wind (kt) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (UTC) | T=00 | =24 | =48 | =72 | =96 | =120 | T=24 | =48 | =72 | T=24 | =48 | =72 |
| **TY Goni (1515)** | | | | | | | | | | | | | |
| Aug. | 14/18 | 0 | 184 | 289 | 383 | 612 | 689 | 11 | 25 | 35 | -15 | -25 | -30 |
| | 15/00 | 0 | 86 | 160 | 264 | 401 | 400 | 0 | 10 | 10 | 0 | -10 | -10 |
| | 15/06 | 0 | 31 | 109 | 193 | 295 | 277 | 0 | 25 | 10 | 0 | -20 | -10 |
| | 15/12 | 15 | 21 | 107 | 191 | 251 | 176 | 10 | 25 | 10 | -5 | -20 | -10 |
| | 15/18 | 44 | 22 | 91 | 222 | 240 | 153 | 10 | 20 | -5 | -10 | -20 | 0 |
| | 16/00 | 0 | 35 | 115 | 190 | 164 | 190 | 15 | 15 | -10 | -15 | -15 | 5 |
| | 16/06 | 0 | 0 | 64 | 114 | 111 | 190 | 30 | 15 | -10 | -25 | -15 | 5 |
| | 16/12 | 0 | 46 | 31 | 81 | 90 | 200 | 25 | 10 | -10 | -20 | -10 | 5 |
| | 16/18 | 0 | 48 | 31 | 57 | 68 | 216 | 10 | -10 | -15 | -10 | 10 | 10 |
| | 17/00 | 0 | 21 | 59 | 90 | 102 | 242 | 0 | -20 | -20 | 0 | 15 | 10 |
| | 17/06 | 0 | 11 | 64 | 78 | 135 | 237 | -10 | -25 | -25 | 5 | 15 | 15 |
| | 17/12 | 0 | 44 | 61 | 39 | 116 | 172 | -10 | -20 | -25 | 5 | 10 | 15 |
| | 17/18 | 0 | 64 | 62 | 81 | 172 | 168 | -20 | -20 | -25 | 15 | 10 | 15 |
| | 18/00 | 21 | 33 | 67 | 56 | 168 | 166 | -20 | -20 | -25 | 15 | 10 | 15 |
| | 18/06 | 15 | 24 | 39 | 79 | 134 | 53 | -20 | -25 | -25 | 15 | 15 | 15 |
| | 18/12 | 0 | 24 | 48 | 90 | 154 | 153 | -15 | -25 | -35 | 10 | 15 | 20 |
| | 18/18 | 0 | 32 | 71 | 112 | 84 | 39 | -20 | -25 | -25 | 10 | 15 | 15 |
| | 19/00 | 0 | 0 | 47 | 112 | 45 | 152 | -20 | -25 | -30 | 10 | 15 | 20 |
| | 19/06 | 0 | 15 | 101 | 101 | 11 | 251 | -25 | -25 | -30 | 15 | 15 | 20 |
| | 19/12 | 0 | 11 | 94 | 79 | 84 | 447 | -25 | -35 | -30 | 15 | 20 | 20 |
| | 19/18 | 0 | 43 | 74 | 15 | 30 | 472 | -25 | -35 | -30 | 15 | 20 | 20 |
| | 20/00 | 0 | 64 | 113 | 15 | 70 | 511 | -25 | -35 | -30 | 15 | 20 | 20 |
| | 20/06 | 0 | 95 | 94 | 35 | 170 | 534 | -25 | -35 | -25 | 15 | 20 | 15 |
| | 20/12 | 0 | 92 | 56 | 20 | 247 | | -30 | -25 | 0 | 20 | 15 | 0 |
| | 20/18 | 0 | 59 | 33 | 23 | 318 | | -30 | -25 | 10 | 20 | 15 | -10 |
| | 21/00 | 15 | 39 | 24 | 11 | 340 | | -25 | -25 | 15 | 15 | 15 | -15 |
| | 21/06 | 0 | 61 | 90 | 45 | 167 | | -25 | -20 | 15 | 15 | 10 | -15 |
| | 21/12 | 0 | 39 | 78 | 90 | | | -25 | -5 | 5 | 15 | 0 | -5 |
| | 21/18 | 0 | 53 | 97 | 180 | | | -10 | 15 | 20 | 5 | -15 | -15 |
| | 22/00 | 15 | 75 | 51 | 268 | | | -10 | 15 | -5 | 5 | -15 | 5 |
| | 22/06 | 0 | 75 | 70 | 234 | | | -5 | 15 | 0 | 0 | -15 | 0 |
| | 22/12 | 0 | 61 | 68 | | | | 15 | 10 | | -15 | -10 | |
| | 22/18 | 15 | 23 | 140 | | | | 20 | 15 | | -20 | -15 | |
| | 23/00 | 15 | 23 | 145 | | | | 20 | 0 | | -20 | 0 | |
| | 23/06 | 0 | 60 | 113 | | | | 25 | 5 | | -25 | -5 | |
| | 23/12 | 0 | 71 | | | | | 5 | | | -5 | | |
| | 23/18 | 0 | 94 | | | | | 10 | | | -10 | | |
| | 24/00 | 0 | 48 | | | | | -10 | | | 10 | | |
| | 24/06 | 0 | 51 | | | | | 5 | | | -5 | | |
| | 24/12 | 0 | | | | | | | | | | | |
| | 24/18 | 0 | | | | | | | | | | | |
| | 25/00 | 0 | | | | | | | | | | | |
| | 25/06 | 0 | | | | | | | | | | | |
| | mean | 4 | 48 | 84 | 114 | 177 | 265 | -6 | -7 | -10 | 2 | 2 | 5 |
| | sample | 43 | 39 | 35 | 31 | 27 | 23 | 39 | 35 | 31 | 39 | 35 | 31 |

| Date/Time | | Center Position (km) | | | | | | Central Pressure (hPa) | | | Max. Wind (kt) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (UTC) | T=00 | =24 | =48 | =72 | =96 | =120 | T=24 | =48 | =72 | T=24 | =48 | =72 |
| **TY Atsani (1516)** | | | | | | | | | | | | | |
| Aug. | 14/18 | 116 | 95 | 189 | 281 | 550 | 853 | 2 | 10 | 25 | -5 | -10 | -20 |
| | 15/00 | 44 | 84 | 183 | 202 | 161 | 226 | 0 | 5 | 20 | 0 | -5 | -20 |
| | 15/06 | 44 | 108 | 179 | 218 | 198 | 276 | 5 | 5 | 10 | 0 | 0 | -10 |
| | 15/12 | 49 | 119 | 168 | 175 | 175 | 261 | 5 | 10 | 10 | 0 | -5 | -5 |
| | 15/18 | 31 | 116 | 128 | 143 | 184 | 287 | 5 | 15 | 5 | -5 | -15 | -5 |
| | 16/00 | 11 | 91 | 108 | 139 | 207 | 266 | 5 | 15 | 5 | -5 | -15 | -5 |
| | 16/06 | 15 | 70 | 119 | 167 | 217 | 310 | 10 | 10 | 5 | -10 | -10 | -5 |
| | 16/12 | 31 | 22 | 55 | 115 | 230 | 273 | 10 | 10 | 0 | -5 | -10 | -5 |
| | 16/18 | 32 | 32 | 48 | 84 | 145 | 220 | 15 | 5 | -5 | -10 | 0 | 0 |
| | 17/00 | 0 | 44 | 24 | 94 | 181 | 237 | 20 | 10 | -5 | -15 | -5 | 0 |
| | 17/06 | 0 | 57 | 42 | 114 | 213 | 223 | 10 | 0 | -15 | -10 | -5 | 5 |
| | 17/12 | 0 | 55 | 11 | 99 | 171 | 219 | 5 | 0 | -15 | -5 | -5 | 5 |
| | 17/18 | 15 | 11 | 39 | 144 | 223 | 286 | 0 | -5 | -20 | 0 | 0 | 10 |
| | 18/00 | 0 | 55 | 84 | 145 | 209 | 301 | -5 | -15 | -30 | 5 | 10 | 20 |
| | 18/06 | 15 | 35 | 101 | 167 | 254 | 337 | -5 | -20 | -35 | 5 | 15 | 25 |
| | 18/12 | 0 | 74 | 102 | 178 | 274 | 395 | -5 | -20 | -35 | 5 | 15 | 25 |
| | 18/18 | 15 | 33 | 84 | 202 | 330 | 464 | -15 | -25 | -35 | 10 | 20 | 25 |
| | 19/00 | 0 | 57 | 90 | 206 | 310 | 486 | -15 | -25 | -30 | 10 | 15 | 20 |
| | 19/06 | 0 | 88 | 159 | 254 | 355 | 576 | -20 | -30 | -30 | 15 | 20 | 20 |
| | 19/12 | 0 | 70 | 135 | 233 | 331 | 532 | -20 | -30 | -30 | 15 | 20 | 20 |
| | 19/18 | 0 | 44 | 172 | 252 | 400 | 682 | -25 | -35 | -30 | 20 | 25 | 20 |
| | 20/00 | 0 | 78 | 157 | 213 | 322 | 830 | -25 | -35 | -30 | 15 | 25 | 20 |
| | 20/06 | 0 | 94 | 150 | 227 | 382 | | -30 | -35 | -30 | 20 | 25 | 20 |
| | 20/12 | 0 | 67 | 121 | 194 | 316 | | -10 | -10 | -5 | 5 | 10 | 10 |
| | 20/18 | 0 | 46 | 88 | 126 | 208 | | -15 | -10 | -5 | 10 | 10 | 10 |
| | 21/00 | 0 | 39 | 67 | 104 | 290 | | -15 | -10 | -5 | 10 | 10 | 10 |
| | 21/06 | 15 | 37 | 87 | 94 | | | -10 | -5 | -5 | 10 | 5 | 10 |
| | 21/12 | 0 | 41 | 75 | 57 | | | 0 | 0 | 0 | 0 | 0 | 5 |
| | 21/18 | 20 | 40 | 77 | 98 | | | 0 | 0 | -10 | 0 | 0 | 15 |
| | 22/00 | 0 | 29 | 66 | 120 | | | 0 | 0 | -10 | 0 | 0 | 15 |
| | 22/06 | 0 | 59 | 65 | | | | 0 | -5 | | 0 | 5 | |
| | 22/12 | 0 | 36 | 64 | | | | -5 | -10 | | 5 | 10 | |
| | 22/18 | 0 | 38 | 69 | | | | -5 | -10 | | 5 | 15 | |
| | 23/00 | 0 | 33 | 24 | | | | -5 | 0 | | 5 | 10 | |
| | 23/06 | 0 | 24 | | | | | -5 | | | 5 | | |
| | 23/12 | 0 | 36 | | | | | -10 | | | 10 | | |
| | 23/18 | 0 | 73 | | | | | -10 | | | 5 | | |
| | 24/00 | 0 | 120 | | | | | 0 | | | 0 | | |
| | 24/06 | 0 | | | | | | | | | | | |
| | 24/12 | 0 | | | | | | | | | | | |
| | 24/18 | 29 | | | | | | | | | | | |
| | 25/00 | 0 | | | | | | | | | | | |
| | mean | 12 | 59 | 98 | 162 | 263 | 388 | -4 | -7 | -11 | 3 | 5 | 8 |
| | sample | 42 | 38 | 34 | 30 | 26 | 22 | 38 | 34 | 30 | 38 | 34 | 30 |

| Date/Time | | Center Position (km) | | | | | | Central Pressure (hPa) | | | Max. Wind (kt) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (UTC) | T=00 | =24 | =48 | =72 | =96 | =120 | T=24 | =48 | =72 | T=24 | =48 | =72 |
| **TY Kilo (1517)** | | | | | | | | | | | | | |
| Sep. | 02/00 | 0 | 32 | 35 | 153 | 403 | 616 | -10 | -15 | -25 | 10 | 15 | 20 |
| | 02/06 | 0 | 71 | 130 | 277 | 416 | 630 | -10 | -20 | -20 | 10 | 20 | 20 |
| | 02/12 | 0 | 62 | 167 | 224 | 399 | 541 | -10 | -20 | -20 | 5 | 15 | 15 |
| | 02/18 | 0 | 74 | 216 | 336 | 384 | 427 | -10 | -30 | -20 | 5 | 20 | 10 |
| | 03/00 | 0 | 55 | 194 | 292 | 362 | 513 | -15 | -30 | -20 | 10 | 20 | 10 |
| | 03/06 | 0 | 51 | 163 | 233 | 369 | 516 | -15 | -15 | -20 | 10 | 10 | 10 |
| | 03/12 | 20 | 61 | 125 | 211 | 215 | 314 | -15 | -15 | -30 | 10 | 10 | 20 |
| | 03/18 | 0 | 71 | 128 | 156 | 195 | 320 | -15 | -10 | -30 | 10 | 5 | 20 |
| | 04/00 | 0 | 52 | 99 | 124 | 134 | 211 | -15 | -10 | -30 | 10 | 5 | 20 |
| | 04/06 | 0 | 62 | 78 | 112 | 142 | 198 | 10 | -5 | -25 | -5 | 5 | 20 |
| | 04/12 | 30 | 33 | 124 | 111 | 171 | 248 | 5 | -10 | -35 | 0 | 10 | 25 |
| | 04/18 | 0 | 69 | 126 | 134 | 145 | 208 | 10 | -15 | -40 | -5 | 10 | 25 |
| | 05/00 | 0 | 39 | 97 | 97 | 160 | 149 | 10 | -15 | -40 | -5 | 10 | 25 |
| | 05/06 | 20 | 51 | 60 | 94 | 150 | 241 | -5 | -20 | -40 | 5 | 15 | 25 |
| | 05/12 | 20 | 80 | 127 | 146 | 152 | 258 | -10 | -30 | -40 | 10 | 20 | 25 |
| | 05/18 | 0 | 46 | 117 | 135 | 157 | 322 | -15 | -35 | -45 | 15 | 25 | 30 |
| | 06/00 | 0 | 54 | 101 | 157 | 211 | 415 | -15 | -35 | -45 | 15 | 25 | 30 |
| | 06/06 | 0 | 59 | 101 | 115 | 180 | 455 | -15 | -35 | -45 | 15 | 25 | 30 |
| | 06/12 | 0 | 60 | 45 | 109 | 145 | | -25 | -35 | -40 | 20 | 25 | 30 |
| | 06/18 | 0 | 87 | 89 | 126 | 360 | | -25 | -40 | -35 | 20 | 30 | 30 |
| | 07/00 | 0 | 67 | 139 | 173 | 334 | | -25 | -40 | -35 | 20 | 30 | 30 |
| | 07/06 | 0 | 56 | 78 | 179 | 457 | | -25 | -40 | -35 | 20 | 30 | 30 |
| | 07/12 | 22 | 24 | 111 | 191 | | | -30 | -45 | -30 | 20 | 35 | 25 |
| | 07/18 | 0 | 24 | 38 | 168 | | | -35 | -40 | -30 | 25 | 30 | 25 |
| | 08/00 | 0 | 59 | 67 | 174 | | | -35 | -35 | -20 | 25 | 25 | 15 |
| | 08/06 | 0 | 45 | 120 | 194 | | | -30 | -30 | -15 | 20 | 25 | 10 |
| | 08/12 | 0 | 73 | 51 | | | | -20 | -15 | | 15 | 15 | |
| | 08/18 | 22 | 35 | 58 | | | | 0 | 5 | | 5 | 0 | |
| | 09/00 | 33 | 30 | 82 | | | | 0 | 5 | | 5 | 0 | |
| | 09/06 | 29 | 93 | 45 | | | | 0 | 5 | | 5 | 0 | |
| | 09/12 | 0 | 78 | | | | | 5 | | | -5 | | |
| | 09/18 | 19 | 66 | | | | | 10 | | | -10 | | |
| | 10/00 | 0 | 56 | | | | | 10 | | | -10 | | |
| | 10/06 | 22 | 68 | | | | | 10 | | | -10 | | |
| | 10/12 | 48 | | | | | | | | | | | |
| | 10/18 | 33 | | | | | | | | | | | |
| | 11/00 | 0 | | | | | | | | | | | |
| | 11/06 | 0 | | | | | | | | | | | |
| | mean | 8 | 57 | 104 | 170 | 256 | 366 | -10 | -22 | -31 | 9 | 17 | 22 |
| | sample | 38 | 34 | 30 | 26 | 22 | 18 | 34 | 30 | 26 | 34 | 30 | 26 |

| Date/Time | | Center Position (km) | | | | | | Central Pressure (hPa) | | | Max. Wind (kt) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (UTC) | T=00 | =24 | =48 | =72 | =96 | =120 | T=24 | =48 | =72 | T=24 | =48 | =72 |
| **STS Etau (1518)** | | | | | | | | | | | | | |
| Sep. | 07/12 | 35 | 104 | | | | | 5 | | | -5 | | |
| | 07/18 | 20 | 169 | | | | | 0 | | | 0 | | |
| | 08/00 | 15 | 78 | | | | | -5 | | | 5 | | |
| | 08/06 | 15 | | | | | | | | | | | |
| | 08/12 | 24 | | | | | | | | | | | |
| | 08/18 | 28 | | | | | | | | | | | |
| | 09/00 | 0 | | | | | | | | | | | |
| | mean | 20 | 117 | -- | -- | -- | -- | 0 | -- | -- | 0 | -- | -- |
| | sample | 7 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 3 | 0 | 0 |

| Date/Time | | Center Position (km) | | | | | | Central Pressure (hPa) | | | Max. Wind (kt) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (UTC) | T=00 | =24 | =48 | =72 | =96 | =120 | T=24 | =48 | =72 | T=24 | =48 | =72 |
| **TS Vamco (1519)** | | | | | | | | | | | | | |
| Sep. | 13/18 | 67 | 82 | | | | | -4 | | | 5 | | |
| | 14/00 | 79 | | | | | | | | | | | |
| | 14/06 | 0 | | | | | | | | | | | |
| | 14/12 | 0 | | | | | | | | | | | |
| | 14/18 | 11 | | | | | | | | | | | |
| | mean | 31 | 82 | -- | -- | -- | -- | -4 | -- | -- | 5 | -- | -- |
| | sample | 5 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |

| Date/Time | | Center Position (km) | | | | | | Central Pressure (hPa) | | | Max. Wind (kt) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (UTC) | T=00 | =24 | =48 | =72 | =96 | =120 | T=24 | =48 | =72 | T=24 | =48 | =72 |
| **TY Krovanh (1520)** | | | | | | | | | | | | | |
| Sep. | 15/18 | 44 | 33 | 15 | 128 | 250 | 356 | 26 | 45 | 25 | -25 | -40 | -15 |
| | 16/00 | 0 | 74 | 51 | 94 | 276 | | 15 | 30 | 5 | -10 | -20 | 0 |
| | 16/06 | 0 | 31 | 55 | 121 | 260 | | 15 | 20 | 5 | -10 | -10 | 0 |
| | 16/12 | 0 | 47 | 91 | 101 | 215 | | 20 | 15 | -5 | -10 | -5 | 10 |
| | 16/18 | 0 | 33 | 46 | 121 | 347 | | 15 | 5 | -15 | -10 | 0 | 15 |
| | 17/00 | 0 | 10 | 56 | 219 | | | 10 | -10 | -20 | -5 | 10 | 20 |
| | 17/06 | 0 | 52 | 44 | 194 | | | 0 | -15 | -30 | 5 | 15 | 30 |
| | 17/12 | 0 | 15 | 169 | 319 | | | -10 | -30 | -32 | 5 | 20 | 35 |
| | 17/18 | 0 | 45 | 153 | 292 | | | -15 | -30 | -32 | 10 | 25 | 35 |
| | 18/00 | 0 | 63 | 174 | | | | -25 | -35 | | 15 | 30 | |
| | 18/06 | 23 | 59 | 151 | | | | -15 | -35 | | 10 | 35 | |
| | 18/12 | 24 | 146 | 214 | | | | -20 | -32 | | 15 | 35 | |
| | 18/18 | 24 | 160 | 308 | | | | -15 | -22 | | 15 | 30 | |
| | 19/00 | 0 | 130 | | | | | -15 | | | 15 | | |
| | 19/06 | 0 | 107 | | | | | -20 | | | 20 | | |
| | 19/12 | 78 | 75 | | | | | -12 | | | 15 | | |
| | 19/18 | 29 | 0 | | | | | -7 | | | 10 | | |
| | 20/00 | 0 | | | | | | | | | | | |
| | 20/06 | 0 | | | | | | | | | | | |
| | 20/12 | 0 | | | | | | | | | | | |
| | 20/18 | 38 | | | | | | | | | | | |
| | mean | 12 | 64 | 117 | 177 | 270 | 356 | -3 | -7 | -11 | 4 | 10 | 14 |
| | sample | 21 | 17 | 13 | 9 | 5 | 1 | 17 | 13 | 9 | 17 | 13 | 9 |

| Date/Time | | Center Position (km) | | | | | | Central Pressure (hPa) | | | Max. Wind (kt) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (UTC) | T=00 | =24 | =48 | =72 | =96 | =120 | T=24 | =48 | =72 | T=24 | =48 | =72 |
| **TY Dujuan (1521)** | | | | | | | | | | | | | |
| Sep. | 22/12 | 323 | 319 | 277 | | | | -4 | 0 | | 0 | 0 | |
| | 22/18 | 206 | 172 | 178 | 268 | 631 | 1119 | -4 | 5 | 15 | 0 | -5 | -15 |
| | 23/00 | 140 | 143 | 128 | 213 | 433 | 763 | -2 | 10 | 15 | -5 | -10 | -15 |
| | 23/06 | 249 | 185 | 168 | 219 | 476 | 820 | 4 | 20 | 25 | -15 | -20 | -25 |
| | 23/12 | 167 | 55 | 109 | 160 | 334 | 673 | 9 | 25 | 35 | -15 | -25 | -35 |
| | 23/18 | 86 | 84 | 94 | 112 | 238 | 507 | 0 | 10 | 30 | 0 | -10 | -30 |
| | 24/00 | 25 | 15 | 46 | 76 | 204 | 358 | 5 | 10 | 40 | -5 | -10 | -40 |
| | 24/06 | 34 | 39 | 43 | 64 | 165 | 262 | 5 | 15 | 40 | -5 | -15 | -40 |
| | 24/12 | 24 | 0 | 15 | 99 | 309 | | 5 | 20 | 35 | -5 | -20 | -35 |
| | 24/18 | 11 | 30 | 41 | 140 | 361 | | 10 | 30 | 35 | -10 | -30 | -35 |
| | 25/00 | 25 | 33 | 33 | 134 | 287 | | 10 | 40 | 35 | -10 | -40 | -35 |
| | 25/06 | 11 | 54 | 89 | 162 | 321 | | 5 | 30 | 30 | -5 | -35 | -35 |
| | 25/12 | 22 | 30 | 98 | 198 | | | 15 | 30 | -10 | -15 | -35 | 0 |
| | 25/18 | 22 | 33 | 47 | 116 | | | 25 | 20 | -25 | -25 | -25 | 15 |
| | 26/00 | 10 | 43 | 65 | 122 | | | 20 | 15 | -20 | -25 | -25 | 15 |
| | 26/06 | 0 | 33 | 46 | 127 | | | 15 | 15 | -24 | -25 | -25 | 25 |
| | 26/12 | 0 | 45 | 134 | | | | 15 | -25 | | -25 | 10 | |
| | 26/18 | 11 | 39 | 74 | | | | 15 | -20 | | -25 | 10 | |
| | 27/00 | 0 | 24 | 52 | | | | 0 | -20 | | -10 | 10 | |
| | 27/06 | 0 | 11 | 42 | | | | 0 | -9 | | -10 | 10 | |
| | 27/12 | 0 | 65 | | | | | -25 | | | 10 | | |
| | 27/18 | 0 | 101 | | | | | -10 | | | 0 | | |
| | 28/00 | 10 | 61 | | | | | 0 | | | 0 | | |
| | 28/06 | 11 | 32 | | | | | 0 | | | 5 | | |
| | 28/12 | 10 | | | | | | | | | | | |
| | 28/18 | 30 | | | | | | | | | | | |
| | 29/00 | 0 | | | | | | | | | | | |
| | 29/06 | 46 | | | | | | | | | | | |
| | mean | 53 | 69 | 89 | 147 | 342 | 643 | 5 | 11 | 17 | -9 | -14 | -19 |
| | sample | 28 | 24 | 20 | 15 | 11 | 7 | 24 | 20 | 15 | 24 | 20 | 15 |

| Date/Time | | Center Position (km) | | | | | | Central Pressure (hPa) | | | Max. Wind (kt) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (UTC) | T=00 | =24 | =48 | =72 | =96 | =120 | T=24 | =48 | =72 | T=24 | =48 | =72 |
| **TY Mujigae (1522)** | | | | | | | | | | | | | |
| Oct. | 01/12 | 0 | 85 | 237 | | | | 8 | 19 | | -15 | -20 | |
| | 01/18 | 21 | 106 | 153 | 276 | | | 7 | 25 | -5 | -10 | -25 | 5 |
| | 02/00 | 53 | 39 | 84 | | | | 5 | 30 | | -5 | -30 | |
| | 02/06 | 31 | 42 | 107 | | | | 0 | 25 | | 0 | -25 | |
| | 02/12 | 22 | 47 | 152 | | | | 0 | 0 | | -5 | -5 | |
| | 02/18 | 31 | 77 | 189 | | | | 5 | -10 | | -10 | 5 | |
| | 03/00 | 33 | 33 | | | | | 20 | | | -20 | | |
| | 03/06 | 21 | 24 | | | | | 15 | | | -15 | | |
| | 03/12 | 0 | 25 | | | | | 5 | | | -10 | | |
| | 03/18 | 0 | 45 | | | | | -5 | | | 0 | | |
| | 04/00 | 0 | | | | | | | | | | | |
| | 04/06 | 0 | | | | | | | | | | | |
| | 04/12 | 0 | | | | | | | | | | | |
| | 04/18 | 0 | | | | | | | | | | | |
| | mean | 15 | 52 | 154 | 276 | -- | -- | 6 | 15 | -5 | -9 | -17 | 5 |
| | sample | 14 | 10 | 6 | 1 | 0 | 0 | 10 | 6 | 1 | 10 | 6 | 1 |

| Date/Time | | Center Position (km) | | | | | | Central Pressure (hPa) | | | Max. Wind (kt) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (UTC) | T=00 | =24 | =48 | =72 | =96 | =120 | T=24 | =48 | =72 | T=24 | =48 | =72 |
| **STS Choi-wan (1523)** | | | | | | | | | | | | | |
| Oct. | 02/06 | 64 | 284 | 69 | 66 | 90 | 513 | 0 | 0 | 0 | 10 | 5 | 10 |
| | 02/12 | 57 | 140 | 68 | 114 | 207 | 497 | 0 | 5 | 0 | 5 | 5 | 10 |
| | 02/18 | 33 | 77 | 85 | 83 | 187 | | -10 | -5 | -5 | 15 | 15 | 15 |
| | 03/00 | 35 | 24 | 43 | 62 | 269 | | -5 | -5 | -15 | 10 | 15 | 25 |
| | 03/06 | 15 | 35 | 94 | 72 | 271 | | -5 | -5 | -10 | 10 | 15 | 20 |
| | 03/12 | 46 | 100 | 100 | 112 | 473 | | -5 | -10 | -15 | 15 | 20 | 20 |
| | 03/18 | 94 | 133 | 114 | 178 | | | -10 | -15 | -20 | 20 | 25 | 25 |
| | 04/00 | 47 | 78 | 79 | 202 | | | -5 | -20 | -15 | 15 | 25 | 20 |
| | 04/06 | 10 | 73 | 90 | 300 | | | -5 | -15 | -15 | 15 | 20 | 20 |
| | 04/12 | 43 | 31 | 61 | 197 | | | -5 | -15 | -10 | 10 | 20 | 15 |
| | 04/18 | 15 | 56 | 73 | | | | -5 | -15 | | 0 | 10 | |
| | 05/00 | 57 | 11 | 98 | | | | -15 | -10 | | 10 | 5 | |
| | 05/06 | 15 | 49 | 58 | | | | -10 | -15 | | 5 | 5 | |
| | 05/12 | 38 | 54 | 27 | | | | -15 | -15 | | 5 | 5 | |
| | 05/18 | 23 | 83 | | | | | -15 | | | 5 | | |
| | 06/00 | 60 | 131 | | | | | -15 | | | 5 | | |
| | 06/06 | 23 | 181 | | | | | -15 | | | 5 | | |
| | 06/12 | 15 | 135 | | | | | -15 | | | 5 | | |
| | 06/18 | 0 | | | | | | | | | | | |
| | 07/00 | 0 | | | | | | | | | | | |
| | 07/06 | 0 | | | | | | | | | | | |
| | 07/12 | 0 | | | | | | | | | | | |
| | mean | 31 | 93 | 76 | 139 | 250 | 505 | -9 | -10 | -10 | 9 | 14 | 18 |
| | sample | 22 | 18 | 14 | 10 | 6 | 2 | 18 | 14 | 10 | 18 | 14 | 10 |

| Date/Time | | Center Position (km) | | | | | | Central Pressure (hPa) | | | Max. Wind (kt) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (UTC) | T=00 | =24 | =48 | =72 | =96 | =120 | T=24 | =48 | =72 | T=24 | =48 | =72 |
| **TY Koppu (1524)** | | | | | | | | | | | | | |
| Oct. | 13/12 | 0 | 78 | 117 | 139 | 125 | 162 | -8 | 5 | 15 | 10 | -10 | -20 |
| | 13/18 | 0 | 46 | 132 | 128 | 180 | 186 | -6 | 10 | 15 | 10 | -15 | -20 |
| | 14/00 | 0 | 49 | 89 | 148 | 178 | 165 | -6 | 15 | 0 | 10 | -15 | 0 |
| | 14/06 | 55 | 62 | 125 | 164 | 201 | 191 | 0 | 20 | 10 | 0 | -20 | -5 |
| | 14/12 | 44 | 79 | 101 | 116 | 177 | 162 | 10 | 20 | 10 | -10 | -20 | -5 |
| | 14/18 | 46 | 78 | 90 | 116 | 140 | 85 | 20 | 25 | 20 | -20 | -25 | -15 |
| | 15/00 | 31 | 55 | 68 | 62 | 120 | 89 | 20 | 15 | 25 | -20 | -10 | -20 |
| | 15/06 | 32 | 89 | 78 | 33 | 130 | 113 | 10 | 10 | 15 | -15 | -5 | -10 |
| | 15/12 | 11 | 49 | 70 | 54 | 159 | 214 | -15 | -5 | 15 | 5 | 5 | -10 |
| | 15/18 | 32 | 55 | 15 | 78 | 131 | 107 | -25 | 0 | 10 | 10 | 0 | -5 |
| | 16/00 | 15 | 78 | 11 | 62 | 112 | 202 | -15 | 5 | 5 | 10 | -10 | 0 |
| | 16/06 | 15 | 64 | 21 | 79 | 118 | | -5 | -5 | 0 | 5 | 0 | 5 |
| | 16/12 | 11 | 54 | 22 | 155 | 118 | | -5 | 15 | -5 | 5 | -5 | 5 |
| | 16/18 | 0 | 11 | 68 | 153 | 116 | | 15 | 15 | -7 | -10 | -10 | 10 |
| | 17/00 | 0 | 48 | 132 | 143 | 110 | | 10 | 5 | -9 | -10 | 0 | 15 |
| | 17/06 | 0 | 34 | 173 | 159 | | | 5 | 0 | -11 | 0 | 5 | 15 |
| | 17/12 | 0 | 46 | 192 | 134 | | | -5 | -5 | -13 | 10 | 5 | 15 |
| | 17/18 | 0 | 72 | 179 | 148 | | | -5 | -7 | -13 | 10 | 10 | 15 |
| | 18/00 | 21 | 87 | 164 | 155 | | | -5 | -9 | -8 | 15 | 15 | 10 |
| | 18/06 | 31 | 81 | 113 | | | | -5 | -11 | | 15 | 15 | |
| | 18/12 | 35 | 169 | 137 | | | | -5 | -8 | | 10 | 10 | |
| | 18/18 | 91 | 170 | 131 | | | | -2 | -6 | | 10 | 10 | |
| | 19/00 | 44 | 105 | 157 | | | | -4 | -6 | | 15 | 10 | |
| | 19/06 | 34 | 77 | | | | | -6 | | | 10 | | |
| | 19/12 | 54 | 107 | | | | | -8 | | | 10 | | |
| | 19/18 | 64 | 168 | | | | | -8 | | | 10 | | |
| | 20/00 | 64 | 169 | | | | | -6 | | | 5 | | |
| | 20/06 | 105 | | | | | | | | | | | |
| | 20/12 | 126 | | | | | | | | | | | |
| | 20/18 | 57 | | | | | | | | | | | |
| | 21/00 | 24 | | | | | | | | | | | |
| | mean | 34 | 81 | 104 | 117 | 141 | 152 | -2 | 4 | 4 | 4 | -3 | -1 |
| | sample | 31 | 27 | 23 | 19 | 15 | 11 | 27 | 23 | 19 | 27 | 23 | 19 |

| Date/Time | | Center Position (km) | | | | | | Central Pressure (hPa) | | | Max. Wind (kt) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (UTC) | T=00 | =24 | =48 | =72 | =96 | =120 | T=24 | =48 | =72 | T=24 | =48 | =72 |
| **TY Champi (1525)** | | | | | | | | | | | | | |
| Oct. | 14/00 | 134 | 198 | 285 | 207 | 182 | 179 | 0 | 5 | 5 | -5 | -10 | -10 |
| | 14/06 | 79 | 204 | 288 | 201 | 196 | 211 | 0 | 10 | 10 | -5 | -10 | -10 |
| | 14/12 | 24 | 156 | 201 | 131 | 168 | 192 | -6 | 5 | 20 | 5 | -5 | -15 |
| | 14/18 | 0 | 178 | 186 | 148 | 157 | 213 | 0 | 5 | 20 | -5 | -5 | -15 |
| | 15/00 | 76 | 225 | 159 | 161 | 167 | 363 | 0 | 5 | 25 | 0 | -5 | -20 |
| | 15/06 | 147 | 223 | 138 | 183 | 308 | 602 | 5 | 10 | 30 | -5 | -10 | -20 |
| | 15/12 | 123 | 195 | 160 | 154 | 232 | 377 | 10 | 20 | 40 | -10 | -15 | -25 |
| | 15/18 | 141 | 134 | 119 | 196 | 370 | 533 | 0 | 10 | 30 | -5 | -10 | -20 |
| | 16/00 | 126 | 112 | 109 | 181 | 482 | 736 | -10 | 10 | 30 | 5 | -10 | -20 |
| | 16/06 | 70 | 90 | 133 | 251 | 452 | 706 | 0 | 20 | 25 | -5 | -15 | -15 |
| | 16/12 | 35 | 49 | 126 | 305 | 421 | 574 | 10 | 25 | 10 | -10 | -20 | -10 |
| | 16/18 | 40 | 67 | 129 | 290 | 466 | 663 | 10 | 25 | 10 | -10 | -20 | -10 |
| | 17/00 | 35 | 33 | 94 | 259 | 443 | 619 | 10 | 15 | 5 | -15 | -10 | -5 |
| | 17/06 | 70 | 44 | 169 | 326 | 487 | 628 | 5 | 5 | 0 | -5 | -5 | 0 |
| | 17/12 | 34 | 79 | 145 | 289 | 471 | 678 | 15 | -5 | 0 | -10 | 0 | 0 |
| | 17/18 | 15 | 57 | 157 | 274 | 449 | 727 | 10 | -10 | -10 | -10 | 5 | 5 |
| | 18/00 | 11 | 30 | 119 | 249 | 428 | 539 | 15 | -5 | 0 | -10 | 5 | 0 |
| | 18/06 | 15 | 35 | 64 | 186 | 402 | 389 | 10 | -5 | 0 | -5 | 5 | 0 |
| | 18/12 | 0 | 11 | 59 | 181 | 273 | 246 | -10 | -20 | -10 | 10 | 15 | 10 |
| | 18/18 | 0 | 15 | 56 | 129 | 230 | 252 | -15 | -20 | -10 | 10 | 15 | 10 |
| | 19/00 | 15 | 24 | 38 | 93 | 189 | 275 | -15 | -15 | 0 | 15 | 15 | 0 |
| | 19/06 | 0 | 33 | 56 | 112 | 215 | 261 | -15 | -10 | 0 | 15 | 10 | 0 |
| | 19/12 | 0 | 49 | 65 | 120 | 360 | 293 | -15 | -10 | 0 | 15 | 10 | 0 |
| | 19/18 | 0 | 68 | 98 | 167 | 308 | 192 | -15 | -10 | 0 | 15 | 10 | 0 |
| | 20/00 | 0 | 76 | 107 | 186 | 311 | 408 | -15 | -5 | -5 | 15 | 5 | 5 |
| | 20/06 | 0 | 69 | 93 | 231 | 356 | 645 | 0 | 5 | 5 | 0 | -5 | 0 |
| | 20/12 | 15 | 59 | 102 | 291 | 254 | | 0 | 5 | 0 | 0 | -5 | 0 |
| | 20/18 | 21 | 80 | 144 | 280 | 254 | | 0 | 5 | -10 | 0 | -5 | 10 |
| | 21/00 | 23 | 46 | 170 | 286 | 440 | | 5 | 0 | -20 | -5 | 0 | 15 |
| | 21/06 | 15 | 94 | 216 | 280 | 570 | | 5 | -5 | -20 | -5 | 5 | 15 |
| | 21/12 | 0 | 60 | 157 | 129 | | | 5 | -10 | -20 | -5 | 5 | 15 |
| | 21/18 | 0 | 75 | 169 | 171 | | | 5 | -20 | -20 | -5 | 15 | 15 |
| | 22/00 | 0 | 84 | 165 | 257 | | | -5 | -35 | -30 | 5 | 25 | 20 |
| | 22/06 | 0 | 83 | 109 | 276 | | | -15 | -35 | -30 | 10 | 25 | 20 |
| | 22/12 | 0 | 81 | 79 | | | | -20 | -35 | | 10 | 25 | |
| | 22/18 | 0 | 80 | 93 | | | | -25 | -25 | | 20 | 15 | |
| | 23/00 | 0 | 32 | 167 | | | | -30 | -25 | | 20 | 20 | |
| | 23/06 | 20 | 41 | 324 | | | | -20 | -20 | | 15 | 15 | |
| | 23/12 | 24 | 66 | | | | | -10 | | | 5 | | |
| | 23/18 | 15 | 59 | | | | | -5 | | | 0 | | |
| | 24/00 | 0 | 29 | | | | | -10 | | | 5 | | |
| | 24/06 | 15 | 75 | | | | | -10 | | | 5 | | |
| | 24/12 | 59 | | | | | | | | | | | |
| | 24/18 | 31 | | | | | | | | | | | |
| | 25/00 | 44 | | | | | | | | | | | |
| | 25/06 | 160 | | | | | | | | | | | |
| | mean | 35 | 83 | 138 | 211 | 335 | 442 | -3 | -4 | 2 | 2 | 2 | -2 |
| | sample | 46 | 42 | 38 | 34 | 30 | 26 | 42 | 38 | 34 | 42 | 38 | 34 |

| Date/Time | | Center Position (km) | | | | | | Central Pressure (hPa) | | | Max. Wind (kt) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (UTC) | T=00 | =24 | =48 | =72 | =96 | =120 | T=24 | =48 | =72 | T=24 | =48 | =72 |
| **TY In-fa (1526)** | | | | | | | | | | | | | |
| Nov. | 17/12 | 31 | 134 | 239 | 310 | 560 | 717 | 2 | 5 | 30 | 0 | -5 | -25 |
| | 17/18 | 35 | 155 | 231 | 295 | 711 | 845 | -4 | 5 | 30 | 5 | -5 | -25 |
| | 18/00 | 0 | 121 | 253 | 492 | 651 | 653 | -4 | 5 | 25 | 10 | 0 | -20 |
| | 18/06 | 11 | 129 | 279 | 434 | 524 | 461 | -17 | 0 | 10 | 20 | 5 | -5 |
| | 18/12 | 0 | 104 | 253 | 335 | 392 | 259 | -15 | 10 | 5 | 20 | 0 | 0 |
| | 18/18 | 22 | 109 | 208 | 327 | 334 | 162 | 0 | 20 | 5 | 5 | -10 | 0 |
| | 19/00 | 11 | 57 | 149 | 234 | 246 | 181 | 15 | 35 | 5 | -15 | -30 | 0 |
| | 19/06 | 0 | 33 | 122 | 189 | 235 | 173 | 25 | 35 | 5 | -25 | -30 | 0 |
| | 19/12 | 0 | 55 | 169 | 237 | 212 | 175 | 25 | 25 | 5 | -15 | -15 | 0 |
| | 19/18 | 0 | 77 | 177 | 204 | 125 | 160 | 25 | 15 | 0 | -15 | -10 | 5 |
| | 20/00 | 0 | 87 | 164 | 214 | 134 | 343 | 15 | 0 | -5 | -15 | 0 | 5 |
| | 20/06 | 0 | 111 | 206 | 213 | 101 | 207 | 5 | -10 | -15 | -10 | 5 | 10 |
| | 20/12 | 0 | 100 | 189 | 177 | 84 | 123 | 0 | -10 | -10 | -5 | 5 | 5 |
| | 20/18 | 0 | 122 | 175 | 148 | 90 | 108 | 0 | -15 | -15 | -5 | 10 | 10 |
| | 21/00 | 0 | 64 | 100 | 190 | 140 | 168 | -25 | -30 | -20 | 15 | 20 | 15 |
| | 21/06 | 0 | 70 | 113 | 192 | 428 | | -25 | -25 | -25 | 15 | 20 | 20 |
| | 21/12 | 11 | 32 | 70 | 199 | 310 | | -20 | -20 | -35 | 15 | 15 | 30 |
| | 21/18 | 0 | 68 | 112 | 230 | 362 | | -25 | -25 | -45 | 20 | 20 | 40 |
| | 22/00 | 0 | 46 | 177 | 395 | 455 | | -5 | -15 | -40 | 5 | 10 | 40 |
| | 22/06 | 0 | 44 | 207 | 451 | | | -5 | -20 | -44 | 5 | 15 | 45 |
| | 22/12 | 35 | 57 | 271 | 569 | | | -5 | -15 | -26 | 5 | 15 | 35 |
| | 22/18 | 0 | 109 | 350 | 608 | | | 5 | -15 | -18 | 0 | 20 | 25 |
| | 23/00 | 0 | 202 | 443 | 688 | | | 5 | -15 | -12 | -5 | 20 | 15 |
| | 23/06 | 0 | 149 | 397 | | | | 5 | -19 | | 0 | 25 | |
| | 23/12 | 15 | 172 | 320 | | | | -10 | -21 | | 10 | 30 | |
| | 23/18 | 39 | 173 | 270 | | | | -20 | -23 | | 20 | 30 | |
| | 24/00 | 15 | 151 | 269 | | | | -25 | -27 | | 25 | 30 | |
| | 24/06 | 21 | 133 | | | | | -19 | | | 20 | | |
| | 24/12 | 11 | 53 | | | | | -4 | | | 10 | | |
| | 24/18 | 0 | 85 | | | | | -2 | | | 0 | | |
| | 25/00 | 24 | 129 | | | | | -4 | | | 0 | | |
| | 25/06 | 15 | | | | | | | | | | | |
| | 25/12 | 49 | | | | | | | | | | | |
| | 25/18 | 35 | | | | | | | | | | | |
| | 26/00 | 84 | | | | | | | | | | | |
| | mean | 13 | 101 | 219 | 319 | 321 | 316 | -3 | -6 | -8 | 4 | 7 | 10 |
| | sample | 35 | 31 | 27 | 23 | 19 | 15 | 31 | 27 | 23 | 31 | 27 | 23 |

| Date/Time | | Center Position (km) | | | | | | Central Pressure (hPa) | | | Max. Wind (kt) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (UTC) | T=00 | =24 | =48 | =72 | =96 | =120 | T=24 | =48 | =72 | T=24 | =48 | =72 |
| **TY Melor (1527)** | | | | | | | | | | | | | |
| Dec. | 11/06 | 22 | 159 | 188 | 307 | 360 | 281 | 0 | 35 | 50 | -5 | -35 | -45 |
| | 11/12 | 65 | 146 | 148 | 310 | 346 | 165 | 7 | 35 | 25 | -10 | -35 | -25 |
| | 11/18 | 40 | 90 | 138 | 293 | 295 | 108 | 17 | 35 | 25 | -20 | -35 | -25 |
| | 12/00 | 22 | 35 | 154 | 239 | 199 | | 22 | 45 | 25 | -25 | -40 | -25 |
| | 12/06 | 22 | 45 | 185 | 216 | 74 | | 35 | 45 | 30 | -35 | -40 | -30 |
| | 12/12 | 22 | 39 | 143 | 166 | 172 | | 30 | 15 | 25 | -25 | -10 | -20 |
| | 12/18 | 0 | 55 | 103 | 148 | 167 | | 20 | 20 | 10 | -15 | -15 | -10 |
| | 13/00 | 0 | 24 | 40 | 127 | | | 15 | 15 | 0 | -10 | -10 | 0 |
| | 13/06 | 0 | 49 | 31 | 60 | | | 5 | 15 | -15 | -5 | -15 | 10 |
| | 13/12 | 0 | 45 | 24 | 103 | | | -10 | 10 | -21 | 5 | -10 | 15 |
| | 13/18 | 0 | 55 | 49 | 137 | | | 0 | 0 | -20 | 0 | 0 | 25 |
| | 14/00 | 0 | 34 | 89 | | | | 5 | 0 | | -5 | -5 | |
| | 14/06 | 0 | 11 | 101 | | | | 5 | -15 | | -5 | 10 | |
| | 14/12 | 0 | 49 | 191 | | | | 10 | -11 | | -5 | 10 | |
| | 14/18 | 0 | 80 | 213 | | | | 0 | -15 | | 0 | 20 | |
| | 15/00 | 0 | 86 | | | | | 0 | | | 0 | | |
| | 15/06 | 0 | 109 | | | | | -15 | | | 15 | | |
| | 15/12 | 22 | 141 | | | | | -21 | | | 20 | | |
| | 15/18 | 40 | 172 | | | | | -15 | | | 20 | | |
| | 16/00 | 0 | | | | | | | | | | | |
| | 16/06 | 108 | | | | | | | | | | | |
| | 16/12 | 74 | | | | | | | | | | | |
| | 16/18 | 95 | | | | | | | | | | | |
| | mean | 23 | 75 | 120 | 191 | 230 | 185 | 6 | 15 | 12 | -6 | -14 | -12 |
| | sample | 23 | 19 | 15 | 11 | 7 | 3 | 19 | 15 | 11 | 19 | 15 | 11 |

**Appendix 4**

## Monthly and Annual Frequencies of Tropical Cyclones

Monthly and annual frequencies of tropical cyclones that attained TS intensity or higher in the western North Pacific and the South China Sea for 1951 - 2015

| Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1951 | | 1 | 1 | 2 | 1 | 1 | 3 | 3 | 2 | 4 | 1 | 2 | 21 |
| 1952 | | | | | | 3 | 3 | 5 | 3 | 6 | 3 | 4 | 27 |
| 1953 | | 1 | | | 1 | 2 | 1 | 6 | 3 | 5 | 3 | 1 | 23 |
| 1954 | | | 1 | | 1 | | 1 | 5 | 5 | 4 | 3 | 1 | 21 |
| 1955 | 1 | 1 | 1 | 1 | | 2 | 7 | 6 | 4 | 3 | 1 | 1 | 28 |
| 1956 | | | 1 | 2 | | 1 | 2 | 5 | 6 | 1 | 4 | 1 | 23 |
| 1957 | 2 | | | 1 | 1 | 1 | 1 | 4 | 5 | 4 | 3 | | 22 |
| 1958 | 1 | | | 1 | 1 | 4 | 7 | 5 | 5 | 3 | 2 | 2 | 31 |
| 1959 | | 1 | 1 | 1 | | | 2 | 5 | 5 | 4 | 2 | 2 | 23 |
| 1960 | | | | 1 | 1 | 3 | 3 | 10 | 3 | 4 | 1 | 1 | 27 |
| 1961 | 1 | | 1 | | 2 | 3 | 4 | 6 | 6 | 4 | 1 | 1 | 29 |
| 1962 | | 1 | | 1 | 2 | | 5 | 8 | 4 | 5 | 3 | 1 | 30 |
| 1963 | | | | 1 | | 4 | 4 | 3 | 5 | 4 | | 3 | 24 |
| 1964 | | | | | 2 | 2 | 7 | 5 | 6 | 5 | 6 | 1 | 34 |
| 1965 | 2 | 1 | 1 | 1 | 2 | 3 | 5 | 6 | 7 | 2 | 2 | | 32 |
| 1966 | | | | 1 | 2 | 1 | 4 | 10 | 9 | 5 | 2 | 1 | 35 |
| 1967 | | 1 | 2 | 1 | 1 | 1 | 7 | 9 | 9 | 4 | 3 | 1 | 39 |
| 1968 | | | | 1 | 1 | 1 | 3 | 8 | 3 | 5 | 5 | | 27 |
| 1969 | 1 | | 1 | 1 | | | 3 | 4 | 3 | 3 | 2 | 1 | 19 |
| 1970 | | 1 | | | | 2 | 3 | 6 | 5 | 5 | 4 | | 26 |
| 1971 | 1 | | 1 | 3 | 4 | 2 | 8 | 5 | 6 | 4 | 2 | | 36 |
| 1972 | 1 | | | | 1 | 3 | 7 | 5 | 4 | 5 | 3 | 2 | 31 |
| 1973 | | | | | | | 7 | 5 | 2 | 4 | 3 | | 21 |
| 1974 | 1 | | 1 | 1 | 1 | 4 | 4 | 5 | 5 | 4 | 4 | 2 | 32 |
| 1975 | 1 | | | | | | 2 | 4 | 5 | 5 | 3 | 1 | 21 |
| 1976 | 1 | 1 | | 2 | 2 | 2 | 4 | 4 | 5 | 1 | 1 | 2 | 25 |
| 1977 | | | 1 | | | 1 | 3 | 3 | 5 | 5 | 1 | 2 | 21 |
| 1978 | 1 | | | 1 | | 3 | 4 | 8 | 5 | 4 | 4 | | 30 |
| 1979 | 1 | | 1 | 1 | 2 | | 4 | 2 | 6 | 3 | 2 | 2 | 24 |
| 1980 | | | | 1 | 4 | 1 | 4 | 2 | 6 | 4 | 1 | 1 | 24 |
| 1981 | | | 1 | 2 | | 3 | 4 | 8 | 4 | 2 | 3 | 2 | 29 |
| 1982 | | | 3 | | 1 | 3 | 3 | 5 | 5 | 3 | 1 | 1 | 25 |
| 1983 | | | | | | 1 | 3 | 5 | 2 | 5 | 5 | 2 | 23 |
| 1984 | | | | | | 2 | 5 | 5 | 4 | 7 | 3 | 1 | 27 |
| 1985 | 2 | | | | 1 | 3 | 1 | 8 | 5 | 4 | 1 | 2 | 27 |
| 1986 | | 1 | | 1 | 2 | 2 | 4 | 4 | 3 | 5 | 4 | 3 | 29 |
| 1987 | 1 | | | 1 | | 2 | 4 | 4 | 6 | 2 | 2 | 1 | 23 |
| 1988 | 1 | | | | 1 | 3 | 2 | 8 | 8 | 5 | 2 | 1 | 31 |
| 1989 | 1 | | | 1 | 2 | 2 | 7 | 5 | 6 | 4 | 3 | 1 | 32 |
| 1990 | 1 | | | 1 | 1 | 3 | 4 | 6 | 4 | 4 | 4 | 1 | 29 |
| 1991 | | | 2 | 1 | 1 | 1 | 4 | 5 | 6 | 3 | 6 | | 29 |
| 1992 | 1 | 1 | | | | 2 | 4 | 8 | 5 | 7 | 3 | | 31 |
| 1993 | | | 1 | | | 1 | 4 | 7 | 6 | 4 | 2 | 3 | 28 |
| 1994 | | | | 1 | 1 | 2 | 7 | 9 | 8 | 6 | | 2 | 36 |
| 1995 | | | | 1 | | 1 | 2 | 6 | 5 | 6 | 1 | 1 | 23 |
| 1996 | | 1 | | 1 | 2 | | 6 | 5 | 6 | 2 | 2 | 1 | 26 |
| 1997 | | | | 2 | 3 | 3 | 4 | 6 | 4 | 3 | 2 | 1 | 28 |
| 1998 | | | | | | | 1 | 3 | 5 | 2 | 3 | 2 | 16 |
| 1999 | | | | 2 | | 1 | 4 | 6 | 6 | 2 | 1 | | 22 |
| 2000 | | | | | 2 | | 5 | 6 | 5 | 2 | 2 | 1 | 23 |
| 2001 | | | | | 1 | 2 | 5 | 6 | 5 | 3 | 1 | 3 | 26 |
| 2002 | 1 | 1 | | | 1 | 3 | 5 | 6 | 4 | 2 | 2 | 1 | 26 |
| 2003 | 1 | | | 1 | 2 | 2 | 2 | 5 | 3 | 3 | 2 | | 21 |
| 2004 | | | | 1 | 2 | 5 | 2 | 8 | 3 | 3 | 3 | 2 | 29 |
| 2005 | 1 | | 1 | 1 | 1 | | 5 | 5 | 5 | 2 | 2 | | 23 |
| 2006 | | | | | 1 | 2 | 2 | 7 | 3 | 4 | 2 | 2 | 23 |
| 2007 | | | | 1 | 1 | | 3 | 4 | 5 | 6 | 4 | | 24 |
| 2008 | | | | 1 | 4 | 1 | 2 | 4 | 4 | 2 | 3 | 1 | 22 |
| 2009 | | | | | 2 | 2 | 2 | 5 | 7 | 3 | 1 | | 22 |
| 2010 | | | 1 | | | | 2 | 5 | 4 | 2 | | | 14 |
| 2011 | | | | | 2 | 3 | 4 | 3 | 7 | 1 | | 1 | 21 |
| 2012 | | | 1 | | 1 | 4 | 4 | 5 | 3 | 5 | 1 | 1 | 25 |
| 2013 | 1 | 1 | | | | 4 | 3 | 6 | 8 | 6 | 2 | | 31 |
| 2014 | 2 | 1 | | 2 | | 2 | 5 | 1 | 5 | 2 | 1 | 2 | 23 |
| 2015 | 1 | 1 | 2 | 1 | 2 | 2 | 3 | 4 | 5 | 4 | 1 | 1 | 27 |
| Normal 1981-2010 | 0.3 | 0.1 | 0.3 | 0.6 | 1.1 | 1.7 | 3.6 | 5.8 | 4.9 | 3.6 | 2.3 | 1.2 | 25.6 |

## Appendix 5

# Code Forms of RSMC Products

## (1) RSMC Tropical Cyclone Advisory (WTPQ20-25 RJTD)

WTPQ i i RJTD YYGGgg
RSMC TROPICAL CYCLONE ADVISORY
NAME class ty-No. name (common-No.)
ANALYSIS
PSTN YYGGgg UTC LaLa.La N LoLoLo.Lo E (or W) confidence
MOVE direction SpSpSp KT
PRES PPPP HPA
MXWD VmVmVm KT
GUST VgVgVg KT
50KT RdRdRd NM (or 50KT RdRdRd NM octant RdRdRd NM octant)
30KT RdRdRd NM (or 30KT RdRdRd NM octant RdRdRd NM octant)
FORECAST
24HF YYGGgg$_F$ UTC LaLa.La$_F$ N LoLoLo.Lo$_F$ E (or W) FrFrFr NM 70%
MOVE direction SpSpSp KT
PRES PPPP HPA
MXWD VmVmVm KT
GUST VgVgVg KT
Ft1Ft1HF YYGGgg$_F$ UTC LaLa.La$_F$ N LoLoLo.Lo$_F$ E (or W) FrFrFr NM 70%
MOVE direction SpSpSp KT
PRES PPPP HPA
GUST VgVgVg KT
MXWD VmVmVm KT
Ft2Ft2HF YYGGgg$_F$ UTC LaLa.La$_F$ N LoLoLo.Lo$_F$ E (or W) FrFrFr NM 70%
MOVE direction SpSpSp KT
PRES PPPP HPA
MXWD VmVmVm KT
GUST VgVgVg KT =

**Notes:**

a. Underlined parts are fixed.

b. Abbreviations

| | | |
|---|---|---|
| PSTN | : | Position |
| MOVE | : | Movement |
| PRES | : | Pressure |
| MXWD | : | Maximum wind |
| HF | : | Hour forecast |

c. Symbolic letters

| | | |
|---|---|---|
| i i | : | '20', '21', '22', '23', '24' or '25' |
| YYGGgg | : | Time of observation submitting the data for analysis in UTC |
| class | : | Intensity classification of the tropical cyclone 'TY', 'STS', 'TS' or 'TD' |
| ty-No. | : | Domestic identification number of the tropical cyclone adopted in Japan given in four digits (same as the international identification number) |
| name | : | Name assigned to the tropical cyclone from the name list prepared by the Typhoon Committee |
| common-No. | : | International identification number of the tropical cyclones given in four digits |
| LaLa.La | : | Latitude of the center position in "ANALYSIS" part |
| LoLoLo.Lo | : | Longitude of the center position in "ANALYSIS" part |
| confidence | : | Confidence of the center position. 'GOOD', 'FAIR' or 'POOR' |
| direction | : | Direction of movement given in 16 azimuthal direction such as 'N', 'NNE', 'NE' and 'ENE' |
| SpSpSp | : | Speed of movement |
| PPPP | : | Central pressure |

| | | |
|---|---|---|
| VmVmVm | : | Maximum sustained wind |
| VgVgVg | : | Maximum gust wind |
| RdRdRd | : | Radii of 30knots and 50knots wind |
| octant | : | Eccentric distribution of wind given in 8 azimuthal direction such as 'NORTH', 'NORTHEAST' and 'EAST' |
| Ft1Ft1 | : | 48 (00, 06, 12 and 18 UTC) or 45 (03, 09, 15 and 21 UTC) |
| Ft2Ft2 | : | 72 (00, 06, 12 and 18 UTC) or 69 (03, 09, 15 and 21 UTC) |
| $YYGGgg_F$ | : | Time in UTC on which the forecast is valid |
| $LaLa.La_F$ | : | Latitude of the center of 70% probability circle in "FORECAST" part |
| $LoLoLo.Lo_F$ | : | Longitude of the center of 70% probability circle in "FORECAST" part |
| FrFrFr | : | Radius of 70% probability circle |

d. MOVE is optionally described as 'ALMOST STATIONARY' or '(direction) SLOWLY', depending on the speed of movement.

**Example:**

WTPQ20 RJTD 150000
RSMC TROPICAL CYCLONE ADVISORY
NAME STS 0320 NEPARTAK (0320)
ANALYSIS
PSTN 150000UTC 12.6N 117.8E FAIR
MOVE WNW 13KT
PRES 980HPA
MXWD 055KT
GUST 080KT
50KT 40NM
30KT 240NM NORTHEAST 160NM SOUTHWEST
FORECAST
24HF 160000UTC 14.7N 113.7E 110NM 70%
MOVE WNW 11KT
PRES 965HPA
MXWD 070KT
GUST 100KT
48HF 170000UTC 16.0N 111.0E 170NM 70%
MOVE WNW 07KT
PRES 970HPA
MXWD 065KT
GUST 095KT
72HF 180000UTC 19.5N 110.0E 250NM 70%
MOVE NNW 09KT
PRES 985HPA
MXWD 050KT
GUST 070KT =

## (2) RSMC Tropical Cyclone Advisory for Five-day Track Forecast (WTPQ50-55 RJTD)

WTPQ i i RJTD YYGGgg
RSMC TROPICAL CYCLONE ADVISORY
NAME class ty-No. name (common-No.)
ANALYSIS
PSTN YYGGgg UTC LaLa.La N LoLoLo.Lo E (or W) confidence
MOVE direction SpSpSp KT
PRES PPPP HPA
MXWD VmVmVm KT
GUST VgVgVg KT
50KT RdRdRd NM (or 50KT RdRdRd NM octant RdRdRd NM octant)
30KT RdRdRd NM (or 30KT RdRdRd NM octant RdRdRd NM octant)
FORECAST
24HF $YYGGgg_F$ UTC $LaLa.La_F$ N $LoLoLo.Lo_F$ E (or W) FrFrFr NM 70%
MOVE direction SpSpSp KT
PRES PPPP HPA
MXWD VmVmVm KT
GUST VgVgVg KT
48HF $YYGGgg_F$ UTC $LaLa.La_F$ N $LoLoLo.Lo_F$ E (or W) FrFrFr NM 70%
MOVE direction SpSpSp KT
PRES PPPP HPA
GUST VgVgVg KT
MXWD VmVmVm KT
72HF $YYGGgg_F$ UTC $LaLa.La_F$ N $LoLoLo.Lo_F$ E (or W) FrFrFr NM 70%

MOVE direction SpSpSp KT
PRES PPPP HPA
MXWD VmVmVm KT
GUST VgVgVg KT
96HF YYGGggF UTC LaLa.LaF N LoLoLo.LoF E (or W) FrFrFr NM 70%
MOVE direction SpSpSp KT
120HF YYGGggF UTC LaLa.LaF N LoLoLo.LoF E (or W) FrFrFr NM 70%
MOVE direction SpSpSp KT=

**Notes:**

a. Underlined parts are fixed.

b. Abbreviations and symbolic letters are the same as those used in RSMC Tropical Cyclone Advisory (WTPQ20-25 RJTD).

**Example:**

WTPQ50 RJTD 060000
RSMC TROPICAL CYCLONE ADVISORY
NAME TY 0908 MORAKOT (0908)
ANALYSIS
PSTN 060000UTC 23.4N 128.3E FAIR
MOVE WNW 09KT
PRES 960HPA
MXWD 075KT
GUST 105KT
50KT 80NM
30KT 350NM SOUTH 300NM NORTH
FORECAST
24HF 070000UTC 24.0N 123.9E 70NM 70%
MOVE W 10KT
PRES 925HPA
MXWD 090KT
GUST 130KT
48HF 080000UTC 25.3N 121.8E 110NM 70%
MOVE WNW 06KT
PRES 950HPA
MXWD 080KT
GUST 115KT
72HF 090000UTC 26.5N 119.7E 160NM 70%
MOVE WNW 06KT
PRES 970HPA
MXWD 065KT
GUST 095KT
96HF 100000UTC 28.0N 118.8E 240NM 70%
MOVE NNW SLOWLY
120HF 110000UTC 29.6N 118.2E 375NM 70%
MOVE NNW SLOWLY =

## (3) RSMC Guidance for Forecast (FXPQ20-25 RJTD)

FXPQ i i RJTD YYGGgg
RSMC GUIDANCE FOR FORECAST
NAME class ty-No. name (common-No.)
PSTN YYGGgg UTC LaLa.La N LoLoLo.Lo E (or W)
PRES PPPP HPA
MXWD WWW KT
FORECAST BY GLOBAL MODEL

| TIME | PSTN | PRES | MXWD |
|---|---|---|---|
| | | (CHANGE FROM T=0) | |
| T=06 | LaLa.La N LoLoLo.Lo E (or W) | appp HPA | awww KT |
| T=12 | LaLa.La N LoLoLo.Lo E (or W) | appp HPA | awww KT |
| T=18 | LaLa.La N LoLoLo.Lo E (or W) | appp HPA | awww KT |
| | : | | |
| T=84 | LaLa.La N LoLoLo.Lo E (or W) | appp HPA | awww KT= |

**Notes:**

a. Underlined parts are fixed.

b. Symbolic letters

| | | |
|---|---|---|
| i i | : | '20', '21', '22', '23', '24' or '25' |
| YYGGgg | : | Initial time of the model in UTC |
| class | : | Intensity classification of the tropical cyclone 'T', 'STS', 'TS' or 'TD' |
| PPPP | : | Central pressure in hPa |
| WWW | : | Maximum wind speed in knots |
| a | : | Sign of ppp and www ( +, - or blank ) |
| ppp | : | Absolute value of change in central pressure from T=0, in hPa |
| www | : | Absolute value of change in maximum wind speed from T=0, in knots |

**Example:**

FXPQ20 RJTD 180600
RSMC GUIDANCE FOR FORECAST
NAME TY 0001DAMREY (0001)
PSTN 180000UTC 15.2N 126.3E
PRES 905HPA
MXWD 105KT
FORECAST BY GLOBAL MODEL
TIME PSTN PRES MXWD
(CHANGE FROM T=0)
T=06 15.4N 125.8E +018HPA -008KT
T=12 15.5N 125.6E +011HPA -011KT
T=18 15.8N 125.7E +027HPA -028KT
:
:
T=84 20.7N 128.8E +021HPA -022KT=

## (4) RSMC Prognostic Reasoning (WTPQ30-35 RJTD)

**Example:**

WTPQ30 RJTD 180000

RSMC TROPICAL CYCLONE PROGNOSTIC REASONING
REASONING NO. 9 FOR TY 0001 DAMREY (0001)
1.GENERAL COMMENTS
REASONING OF PROGNOSIS THIS TIME IS SIMILAR TO PREVIOUS ONE.
POSITION FORECAST IS MAINLY BASED ON NWP AND PERSISTENCY.
2.SYNOPTIC SITUATION
SUBTROPICAL RIDGE WILL NOT CHANGE ITS LOCATION AND STRENGTH FOR THE NEXT 24 HOURS.
3.MOTION FORECAST
POSITION ACCURACY AT 180000 UTC IS GOOD.
TY WILL DECELERATE FOR THE NEXT 12 HOURS.
TY WILL RECURVE WITHIN 60 HOURS FROM 180000 UTC.
TY WILL MOVE WEST FOR THE NEXT 12 HOURS THEN MOVE GRADUALLY TO WEST-NORTHWEST.
4.INTENSITY FORECAST
TY WILL KEEP PRESENT INTENSITY FOR NEXT 24 HOURS.
FI-NUMBER WILL BE 7.0 AFTER 24 HOURS.=

## (5) Tropical Cyclone Advisory for SIGMET (FKPQ30-35 RJTD)

| | |
|---|---|
| FKPQ i i RJTD YYGGgg | |
| TC ADVISORY | |
| DTG: | yyyymmdd/time Z |
| TCAC: | TOKYO |
| TC: | name |
| NR: | number |
| PSN: | N LaLa.LaLa E LoLoLo.LoLo |
| MOV: | direction SpSpSp KT |
| C: | PPPP HPA |
| MAX WIND: | WWW KT |
| FCST PSN +6HR: | YY/GGgg Z NLaLa.LaLa ELoLoLo.LoLo* |

| | |
|---|---|
| FCST MAX WIND +6HR: | WWW KT* |
| FCST PSN +12HR: | YY/GGgg Z NLaLa.LaLa ELoLoLo.LoLo |
| FCST MAX WIND +12HR: | WWW KT |
| FCST PSN +18HR: | YY/GGgg Z NLaLa.LaLa ELoLoLo.LoLo* |
| FCST MAX WIND +18HR: | YY/GGgg Z NLaLa.LaLa ELoLoLo.LoLo* |
| FCST PSN +24HR: | YY/GGgg Z N LaLa.LaLa E LoLoLo.LoLo |
| FCST MAX WIND +24HR: | WWW KT |
| RMK: | NIL = |
| NXT MSG: | yyyymmdd/time Z |

* 6 hour and 18 hour forecasts are added from 22 May 2008.

**Notes:**

a. Underlined parts are fixed.

b. Abbreviations

| | | |
|---|---|---|
| DTG | : | Date and time |
| TCAC | : | Tropical Cyclone Advisory Centre |
| TC | : | Tropical Cyclone |
| NR | : | Number |
| PSN | : | Position |
| MOV | : | Movement |
| C | : | Central pressure |
| MAX WIND | : | Maximum wind |
| FCST | : | Forecast |
| RMK | : | Remarks |
| NXT MSG | : | Next message |

c. Symbolic letters

| | | |
|---|---|---|
| i i | : | '30', '31', '32', '33', '34' or '35' |
| YYGGgg | : | Date(YY), hour(GG) and minute(gg) in UTC (Using “Z”) |
| yyyymmdd/time | : | Year(yyyy), month(mm), date(dd), hour and minute (time) in UTC (Using “Z”) |
| name | : | Name assigned to the tropical cyclone by RSMC Tokyo-Typhoon Center |
| Number | : | Advisory number (starting with “01” for each cyclone) |
| LaLa.LaLa | : | Latitude of the center position |
| LoLoLo.LoLo | : | Longitude of the center position |
| direction | : | Direction of movement given in 16 azimuthal direction such as 'N', 'NNE', 'NE' and 'ENE' |
| SpSpSp | : | Speed of movement. “SLW” for less than 3 kt “STNR” for less than 1 kt. |
| PPPP | : | Central pressure |
| WWW | : | Maximum sustained wind |

**Example:**

FKPQ30 RJTD 271200
TC ADVISORY

| | |
|---|---|
| DTG: | 20080927/1200Z |
| TCAC: | TOKYO |
| TC: | JANGMI |
| NR: | 15 |
| PSN: | N2120 E12425 |
| MOV: | NW 13KT |
| C: | 910HPA |
| MAX WIND: | 115KT |
| FCST PSN +6HR: | 27/1800Z N2200 E12330 |
| FCST MAX WIND +6HR: | 115KT |
| FCST PSN +12HR: | 28/0000Z N2240 E12250 |
| FCST MAX WIND +12HR: | 115KT |
| FCST PSN +18HR: | 28/0600Z N2340 E12205 |
| FCST MAX WIND +18HR: | 95KT |
| FCST PSN +24HR: | 28/1200Z N2440 E12105 |
| FCST MAX WIND +24HR: | 80KT |
| RMK: | NIL |
| NXT MSG: | 20080927/1800Z = |

## (6) RSMC Tropical Cyclone Best Track (AXPQ20 RJTD)

AXPQ20 RJTD YYGGgg
RSMC TROPICAL CYCLONE BEST TRACK
NAME ty-No. name (common-No.)
PERIOD FROM MMMDDTTUTC TO MMMDDTTUTC
DDTT LaLa.LaN LoLoLo.LoE PPPHPA WWWKT DDTT LaLa.LaN LoLoLo.LoE PPPHPA WWWKT
DDTT LaLa.LaN LoLoLo.LoE PPPHPA WWWKT DDTT LaLa.LaN LoLoLo.LoE PPPHPA WWWKT
:
:
DDTT LaLa.LaN LoLoLo.LoE PPPHPA WWWKT DDTT LaLa.LaN LoLoLo.LoE PPPHPA WWWKT
REMARKS[1)]
TD FORMATION AT MMMDDTTUTC
FROM TD TO TS AT MMMDDTTUTC
:
:
DISSIPATION AT MMMDDTTUTC=

**Notes:**

a. Underlined parts are fixed.

b. [1)] REMARKS is given optionally.

c. Symbolic letters

| | | |
|---|---|---|
| MMM | : | Month in UTC given such as 'JAN' and 'FEB' |
| DD | : | Date in UTC |
| TT | : | Hour in UTC |
| PPP | : | Central pressure |
| WWW | : | Maximum wind speed |

**Example:**

AXPQ20 RJTD 020600

RSMC TROPICAL CYCLONE BEST TRACK
NAME 0001 DAMREY (0001)
PERIOD FROM OCT1300UTC TO OCT2618UTC
1300 10.8N 155.5E 1008HPA //KT 1306 10.9N 153.6E 1006HPA //KT
1312 11.1N 151.5E 1004HPA //KT 1318 11.5N 149.8E 1002HPA //KT
1400 11.9N 148.5E 1000HPA //KT 1406 12.0N 146.8E 998HPA 35KT
:
:
1712 14.6N 129.5E 905HPA 105KT 1718 14.7N 128.3E 905HPA 105KT
:
:
2612 32.6N 154.0E 1000HPA //KT 2618 33.8N 157.4E 1010HPA //KT
REMARKS
TD FORMATION AT OCT1300UTC
FROM TD TO TS AT OCT1406UTC
FROM TS TO STS AT OCT1512UTC
FROM STS TO TY AT OCT1600UTC
FROM TY TO STS AT OCT2100UTC
FROM STS TO TS AT OCT2112UTC
FROM TS TO L AT OCT2506UTC
DISSIPATION AT OCT2700UTC=

**Appendix 6**

## Specifications of JMA NWP (GSM, TEPS)

The Global Spectral Model (GSM) and the Typhoon Ensemble Prediction System (TEPS) are used in JMA as a primary basis for TC forecasts. GSM (TL959L100) has about 20 km horizontal resolution and 100 vertical layers. Details on the GSM are found in Yonehara et al. (2014). TEPS (TL479L60) has 25 members with approximately 40 km horizontal resolution and 60 vertical layers. Details on the TEPS are found in Kyouda and Higaki (2015). A singular vector (SV) method is employed for the initial perturbation setup. The stochastic physics scheme (Buizza et al. 1999) is also introduced in consideration of model uncertainties associated with physical parameterizations. The general specifications of GSM and TEPS are summarized in Table 6.1.

Table 6.1 Specifications of GSM and TEPS

| NWP Models | GSM (Global Spectral Model), TL959L100 | TEPS (Typhoon Ensemble Prediction System), TL479L60 |
|---|---|---|
| Resolution | 20 km, 100 layers (Top: 0.01hPa) | 40 km, 60 layers (Top: 0.1hPa) |
| Area | Global | Global |
| Method for initial value | Global Data Assimilation System (4DVAR)<br>Outer resolution: TL959L100<br>Inner resolution: TL319L100<br>Window: Init-3h to Init + 3h | Unperturbed condition: Truncated GSM initial condition<br>Initial perturbation: SV-based perturbation<br>Ensemble size: 25 (24 perturbed members and 1 control member)<br>SV target areas: Northwestern Pacific (20°N -60°N, 100 °E -180°) and vicinities of up to 3 TCs in the Typhoon Center's area of responsibility (e.g. Figure 6.1) |
| Forecast time (and initials) | 84h (00, 06, 18 UTC)<br>264h (12 UTC) | 132h (00, 06, 12, 18 UTC) |
| Operational as from | 18 March 2014 | 11 March 2014<br>(de facto from T1404) |

[Recent upgrades on GSM and the Global Data Assimilation System and TEPS]
Global Data Assimilation System:

- Assimilation of METAR surface pressure data was started, and usage of ASCAT ocean surface wind vector data was improved (October 2015).
- Assimilation of Megha-Tropiques/SAPHIR data was started (June 2015).

TEPS is an ensemble prediction system used mainly for TC track forecasts up to five days ahead. Two SV calculations are introduced into the system to efficiently capture the uncertainty of TC track forecasts. One produces SVs with a spatial target area fixed on the Northwestern Pacific (20°N - 60°N, 100°E - 180°), and the other produces SVs whose spatial target area can be moved within a 750 km radius of a predicted TC's position in one-day forecasting. Up to three movable areas can be configured for different TCs at one initial time. If more than three TCs are present in the area of responsibility, three are selected in the order of concern as prioritized by the RSMC Tokyo – Typhoon Center. Figure 6.1 shows an example of SV spatial target areas. At this initial time, there were three TCs in the area. Figure 6.2 shows an example of TEPS forecast tracks for PHANFONE (TY1418). In this case, the forecasted TC track of the control member showed that the typhoon would hit both Nansei Islands (southwestern islands off Kyushu) and Kyushu (southernmost of the four main islands of Japan). In addition, ensemble TC tracks suggested that there would be widespread probabilities of not only typhoon hitting but also typhoon passing by off the Pacific. As a result, some TC tracks were close to the best track during the period.

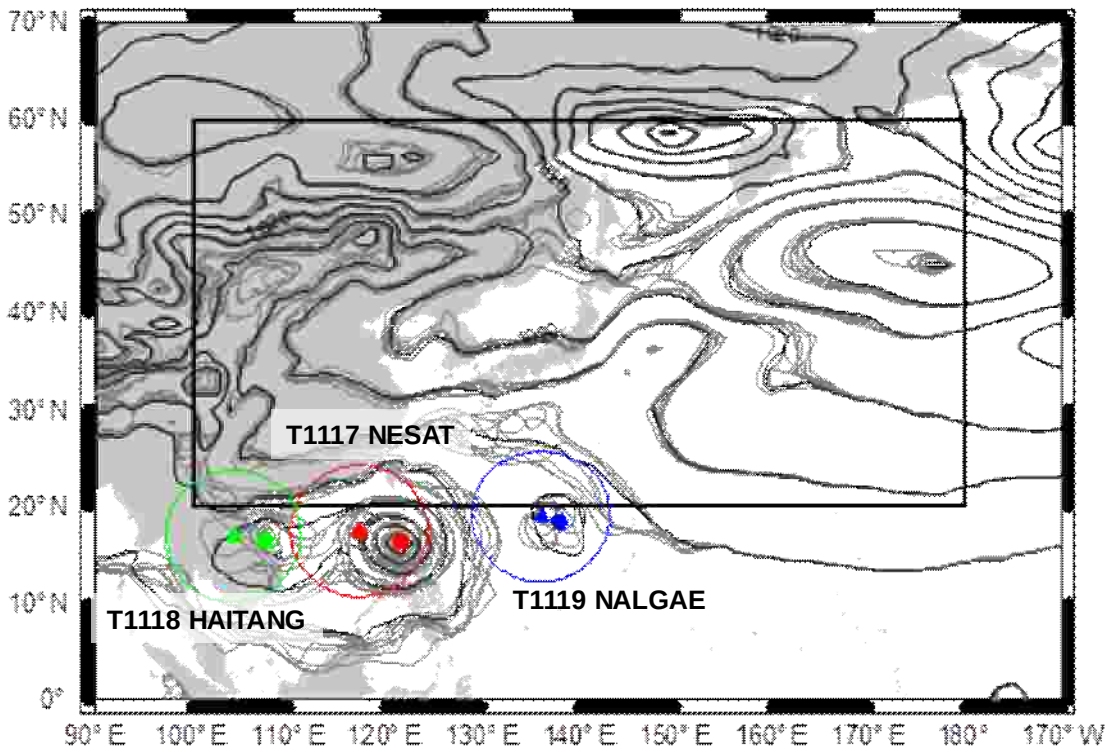



Figure 6.1 Example of SV spatial target areas of TEPS (Initial time: 00UTC 27 September 2011). The large thick rectangle shows the fixed area and the circles show the three movable areas which are set around a predicted TC's position. Filled circles and triangles show TCs' central positions at the initial time and in one-day forecasting, respectively. Gray contours show the initial sea level pressure of each member.

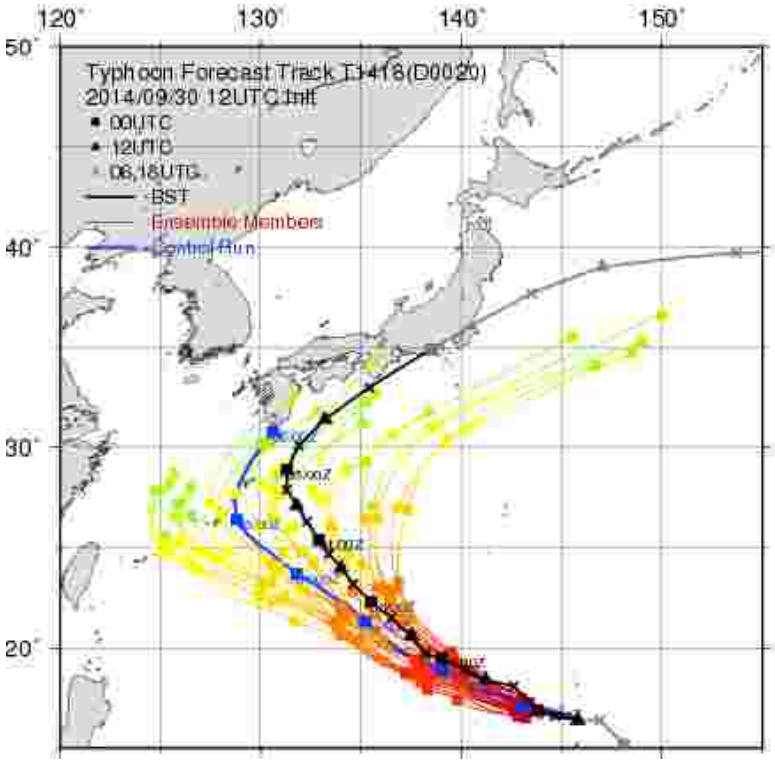



Figure 6.2 Example of TEPS forecast track (Initial time: 12UTC 30 September 2014). Black and blue lines denote TC best track and forecast track of control member respectively. Red, dark orange, orange, yellow and green lines show TC forecast tracks of all perturbed members up to 48, 72, 96, 120 and 132 hours, respectively.

[References]

Buizza, R., M. Miller, and T. N. Palmer, 1999: Stochastic representation of model uncertainties in the ECMWF Ensemble Prediction System. Quart. J. Roy. Meteor. Soc., 125, 2887–2908.

Kyouda, M. and M. Higaki, 2015: Upgrade of JMA's Typhoon Ensemble Prediction System, RSMC Tokyo-Typhoon Center Technical Review, 17-1, p.13. http://www.jma.go.jp/jma/jma-eng/jma-center/rsmc-hp-pub-eg/techrev/text17-1.pdf

Yonehara, H., M. Ujiie, T. Kanehama, R. Sekiguchi and Y. Hayashi, 2014: Upgrade of JMA's Operational NWP Global Model, CAS/JSC WGNE Res. Activ. Atmos. Oceanic Modell., 44, 06.19-06.20.

## Appendix 7

**NWP products (GSM and EPS) provided on WIS GISC Tokyo server**
(Available at http://www.wis-jma.go.jp/cms/)

| Model | GSM | GSM | GSM |
|---|---|---|---|
| Area and resolution | Whole globe, 1.25°×1.25° | 20°S–60°N, 60°E–160°W<br>1.25°×1.25° | Whole globe, 2.5°×2.5° |
| Levels and elements | 10 hPa: Z, U, V, T<br>20 hPa: Z, U, V, T<br>30 hPa: Z, U, V, T<br>50 hPa: Z, U, V, T<br>70 hPa: Z, U, V, T<br>100 hPa: Z, U, V, T<br>150 hPa: Z, U, V, T<br>200 hPa: Z, U, V, T, ψ, χ<br>250 hPa: Z, U, V, T<br>300 hPa: Z, U, V, T, H, ω<br>400 hPa: Z, U, V, T, H, ω<br>500 hPa: Z, U, V, T, H, ω, ζ<br>600 hPa: Z, U, V, T, H, ω<br>700 hPa: Z, U, V, T, H, ω<br>850 hPa: Z, U, V, T, H, ω, ψ, χ<br>925 hPa: Z, U, V, T, H, ω<br>1000 hPa: Z, U, V, T, H, ω<br>Surface: P, U, V, T, H, R† | 10 hPa: Z, U, V, T<br>20 hPa: Z, U, V, T<br>30 hPa: Z, U, V, T<br>50 hPa: Z, U, V, T<br>70 hPa: Z, U, V, T<br>100 hPa: Z, U, V, T<br>150 hPa: Z, U, V, T<br>200 hPa: Z§, U§, V§, T§, ψ, χ<br>250 hPa: Z, U, V, T<br>300 hPa: Z, U, V, T, D<br>400 hPa: Z, U, V, T, D<br>500 hPa: Z§, U§, V§, T§, D§, ζ<br>700 hPa: Z§, U§, V§, T§, D§, ω<br>850 hPa: Z§, U§, V§, T§, D§, ω, ψ, χ<br>925 hPa: Z, U, V, T, D, ω<br>1000 hPa: Z, U, V, T, D<br>Surface: P¶, U¶, V¶, T¶, D¶, R¶ | 10 hPa: Z*, U*, V*, T*<br>20 hPa: Z*, U*, V*, T*<br>30 hPa: Z°, U°, V°, T°<br>50 hPa: Z°, U°, V°, T°<br>70 hPa: Z°, U°, V°, T°<br>100 hPa: Z°, U°, V°, T°<br>150 hPa: Z*, U*, V*, T*<br>200 hPa: Z, U, V, T<br>250 hPa: Z°, U°, V°, T°<br>300 hPa: Z, U, V, T, D*‡<br>400 hPa: Z*, U*, V*, T*, D*‡<br>500 hPa: Z, U, V, T, D*‡<br>700 hPa: Z, U, V, T, D<br>850 hPa: Z, U, V, T, D<br>1000 hPa: Z, U*, V*, T*, D*‡<br>Surface: P, U, V, T, D*‡, R† |
| Forecast hours | 0–84 every 6 hours and<br>96–192 every 12 hours<br>† Except analysis | 0–84 (every 6 hours)<br>§ 96–192 (every 24 hours) for 12UTC initial<br>¶ 90–192 (every 6 hours) for 12UTC initial | 0–72 every 24 hours and<br>96–192 every 24 hours for 12UTC<br>° 0–120 for 12UTC<br>† Except analysis<br>* Analysis only |
| Initial times | 00, 06, 12, 18UTC | 00, 06, 12, 18UTC | 00UTC and 12UTC<br>‡ 00UTC only |

| Model | One-week EPS |
|---|---|
| Area and resolution | Whole globe, 2.5°×2.5° |
| Levels and elements | 250 hPa: μU, σU, μV, σV<br>500 hPa: μZ, σZ<br>850 hPa: μU, σU, μV, σV, μT, σT<br>1000 hPa: μZ, σZ<br>Surface: μP, σP |
| Forecast hours | 0–192 every 12 hours |
| Initial times | 00, 12UTC |

| Model | GSM | GSM |
|---|---|---|
| Area and resolution | 5S-90N and 30E-165W,<br>Whole globe<br>0.25° × 0.25° | 5S-90N and 30E-165W,<br>Whole globe<br>0.5° × 0.5° |
| Levels and elements | Surface: U, V, T, H, P, Ps, R, Cla, Clh, Clm, Cll | 10 hPa: Z, U, V, T, H, ω<br>20 hPa: Z, U, V, T, H, ω<br>30 hPa: Z, U, V, T, H, ω<br>50 hPa: Z, U, V, T, H, ω<br>70 hPa: Z, U, V, T, H, ω<br>100 hPa: Z, U, V, T, H, ω<br>150 hPa: Z, U, V, T, H, ω<br>200 hPa: Z, U, V, T, H, ω, ψ, χ<br>250 hPa: Z, U, V, T, H, ω<br>300 hPa: Z, U, V, T, H, ω<br>400 hPa: Z, U, V, T, H, ω<br>500 hPa: Z, U, V, T, H, ω, ζ<br>600 hPa: Z, U, V, T, H, ω<br>700 hPa: Z, U, V, T, H, ω<br>800 hPa: Z, U, V, T, H, ω<br>850 hPa: Z, U, V, T, H, ω, ψ, χ<br>900 hPa: Z, U, V, T, H, ω<br>925 hPa: Z, U, V, T, H, ω<br>950 hPa: Z, U, V, T, H, ω<br>975 hPa: Z, U, V, T, H, ω<br>1000 hPa: Z, U, V, T, H, ω<br>Surface: U, V, T, H, P, Ps, R, Cla, Clh, Clm, Cll |
| Forecast hours | 0–84 (every 3 hours)<br>90–264 (every 6 hours) are available for 12 UTC Initial | 0–84 (every 3 hours)<br>90–264 (every 6 hours) are available for 12 UTC Initial |
| Initial times | 00, 06, 12, 18 UTC | 00, 06, 12, 18 UTC |

Notes:

| | | |
|---|---|---|
| Z: geopotential height | U: eastward wind | V: northward wind |
| T: temperature | D: dewpoint depression | H: relative humidity |
| ω: vertical velocity | ζ: vorticity | ψ: stream function |
| χ: velocity potential | P: sea level pressure | Ps: pressure |
| R: rainfall | Cla: total cloudiness | Clh: cloudiness (upper layer) |
| Clm: cloudiness (middle layer) | | Cll: cloudiness (lower layer) |

The prefixes μ and σ represent the average and standard deviation of ensemble prediction results respectively.
The symbols °, *, ¶, §, ‡ and † indicate limitations on forecast hours or initial time as shown in the tables.

**Other products on WIS GISC Tokyo server**
(Available at http://www.wis-jma.go.jp/cms/)

| Data | Contents / frequency (initial time) |
|---|---|
| Satellite products | High density atmospheric motion vectors (BUFR)<br>(a) MTSAT-2 (VIS, IR, WV), 60S-60N, 90E-170W<br>VIS: every hour (00-09, 21-23 UTC), IR and WV: every hour<br>(b) Himawari-8 (VIS, IR, WV), 60S-60N, 90E-170W<br>VIS: every hour (Northern Hemisphere: 00-09, 21-23 UTC;<br>Southern Hemisphere: 00-08, 21-23 UTC), IR and WV: every hour<br>Clear Sky Radiance (CSR) data (BUFR)<br>(a) MTSAT-2 (IR, WV) radiances and brightness temperatures<br>averaged over cloud-free pixels: every hour<br>(b) Himawari-8 radiances and brightness temperatures<br>averaged over cloud-free pixels: every hour |
| Tropical cyclone Information | Tropical cyclone related information (BUFR)<br>• tropical cyclone analysis data (00, 06, 12 and 18 UTC) |
| Wave data | Global Wave Model (GRIB2)<br>• significant wave height<br>• prevailing wave period<br>• wave direction<br>Forecast hours:<br>0–84 every 6 hours (00, 06 and 18UTC)<br>0–84 every 6 hours and 96-192 every 12 hours (12 UTC) |
| Observational data | (a) Surface data (TAC/TDCF)<br>SYNOP, SHIP, BUOY: Mostly 4 times a day<br>(b) Upper-air data (TAC/TDCF)<br>TEMP (parts A-D), PILOT (parts A-D): Mostly twice a day |
| Storm surge | Storm surge model for Asian area<br>• storm surge distribution (map image)<br>• time series charts (at requested locations)<br>The plotted values are storm surges, predicted water levels, astronomical tides, surface winds, and sea level pressures.<br>Forecast hours:<br>0–72 every 3 hours (00, 06 12, and 18UTC)<br>Only in the case of a tropical cyclone being in the forecast time<br>(Available at https://tynwp-web.kishou.go.jp/) |
| SATAID service | (a) Satellite imagery (SATAID)<br>Himawari-8<br>(b) Observation data (SATAID)<br>SYNOP, SHIP, METAR, TEMP (A, B) and ASCAT sea-surface wind<br>(c) NWP products (SATAID)<br>GSM<br>(Available at http://www.wis-jma.go.jp/cms/sataid/) |

**Appendix 8**

# User's Guide to the DVD

## Preface

This DVD contains all the texts, tables and charts of the RSMC Annual Report 2015 along with satellite images of the tropical cyclones that attained TS intensity or higher in the western North Pacific and the South China Sea in 2015. This document is a brief user's guide on how to use the DVD, which was mastered in ISO-9660 format.

## Directory and File layout

[Root]
|------TopMenu.html (start menu html page)
|------Readme.txt (brief explanation of the DVD)
|------SATAIDmanual.pdf (user manual for the satellite image viewer)
|------Annual_Report
|---Text (text of Annual Report 2015 in PDF)
|---Figure (figures in PDF)
|---Table (tables in PDF)
|---Appendix (appendices for MS Word, Excel and PDF)
|------Best_Track
|---E_BST_2015.txt (best track data for 2015)
|---E_BST_201501.txt (best track data for TCs generated in January 2015)
:
|---E_BST_201512.txt (best track data for TCs generated in December 2015)
|------SATAID
|---Gmslpd.exe (viewer; tropical cyclone version in English for 32-bit OS)
|---Gsetup.exe (setup program for 32-bit OS)
|---Gmslpd64.exe (viewer; tropical cyclone version in English for 64-bit OS)
|---Gsetup64.exe (setup program for 64-bit OS)
|------Satellite_Images
|---T1501 (hourly satellite image data for T1501)
|---T1502 (hourly satellite image data for T1502)
:
|---T1527 (hourly satellite image data for T1527)

**How to use the DVD**

The start menu shown when the DVD is inserted or the TopMenu.html file is clicked contains links titled Annual Report 2015, SATAID Installation for 32-bit OS/64-bit OS, Satellite Images and About this DVD. Click the link or the file name of the content you wish to see and follow the instructions on the display.

Hardware/OS requirements for using the DVD:

Hardware : PC/AT compatible
OS : Microsoft Windows XP or later

**< Annual Report 2015>**

Annual Report 2015 is provided in two formats as PDF files and MS Word/Excel files.

- PDF files:

Click *Annual Report 2015* to open the text in PDF. If you cannot open it, download Adobe Reader from Adobe's website (http://www.adobe.com/). Adobe Reader (or Adobe Acrobat) is required to view PDF files.

- MS Word/Excel files:

The original figures and tables prepared with Microsoft Word or Excel are contained in the Annual Report folder of the DVD.

**< SATAID Installation >**

- Installation of the program for displaying satellite images

Click *SATAID Installation for 32-bit OS/64-bit OS* to run the setup program (Gsetup.exe for 32-bit OS/Gsetup64.exe for 64-bit OS) for the satellite image viewer (SATAID). Follow the instructions to install SATAID (Gmslpd.exe for 32-bit OS/Gmslpd64.exe for 64-bit OS).

**< Satellite Images >**

- Displaying satellite images

After installing SATAID, click *Satellite Images* in Internet Explorer or Firefox to launch SATAID and display a list of tropical cyclones occurring in 2015 in the selection window. Choose and click a tropical cyclone from the list to see hourly satellite images of it. You can also display the track of the tropical cyclone superimposed onto the satellite image and measure its intensity using the Dvorak method.

- User manual for the viewer

Besides the above features, the viewer has many other useful functions. See the User Manual (SATAIDmanual.pdf) for further details on its use.

- Explanation of satellite image data

| | |
|---|---|
| Satellite | : MTSAT (to 01UTC 7th July 2015)<br>Himawari-8 (from 02UTC 7th July 2015) |
| Period | : From the TD formation to the time of dissipation |
| Images | : Infrared images (00 to 23 UTC)<br>Visible images (00 to 13 and 17 to 23 UTC for MTSAT,<br>00 to 12 and 17 to 23 UTC for Himawari-8) |
| Range | : 40 degrees in both latitude and longitude<br>(The image window moves to follow the track of the tropical cyclone so that its center remains in the middle of the window.) |
| Time interval | : Hourly |
| Resolution | : 0.05 degrees in both latitude and longitude |
| Compression of file | : Compressed using the *compress.exe* command of Microsoft Windows |

**< About this DVD >**

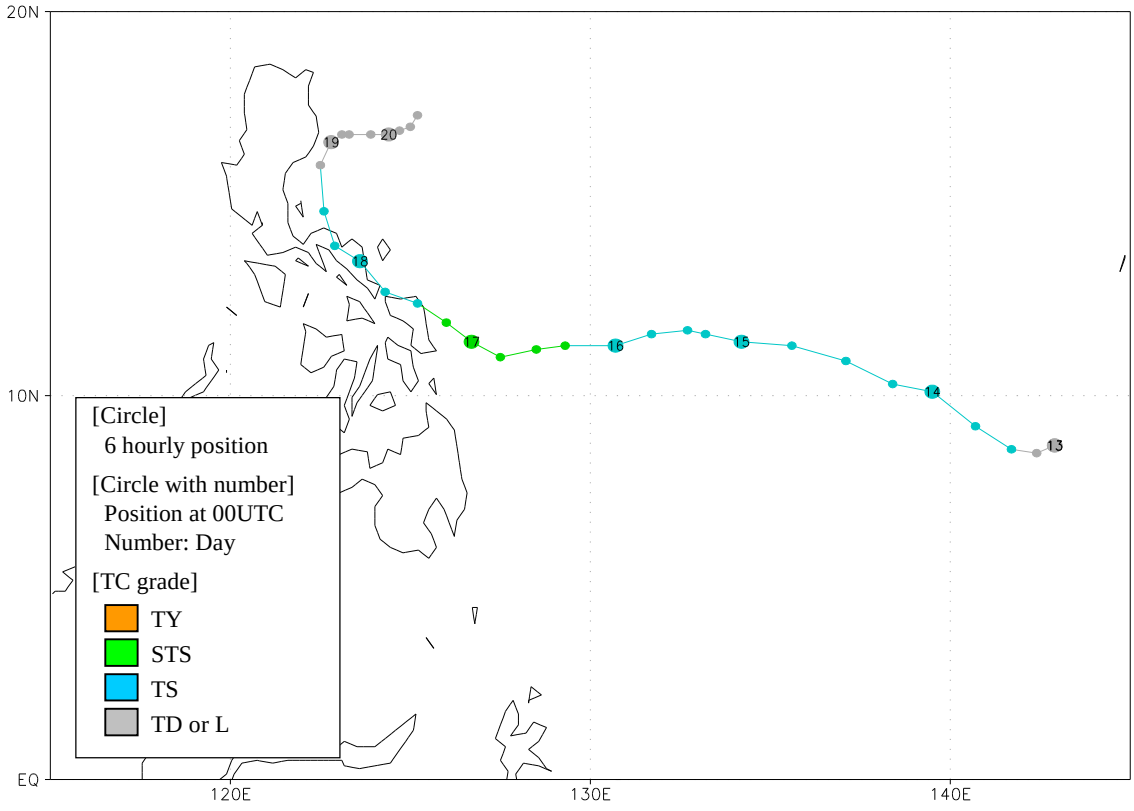
Click *About this DVD* to open the *Readme.txt* file.

For further information, please contact:

RSMC Tokyo - Typhoon Center
Forecast Division
Forecast Department
Japan Meteorological Agency
1-3-4 Otemachi, Chiyoda-ku, Tokyo 100-8122, Japan
FAX: +81-3-3211-8303
E-mail: rsmc-tokyo@met.kishou.go.jp

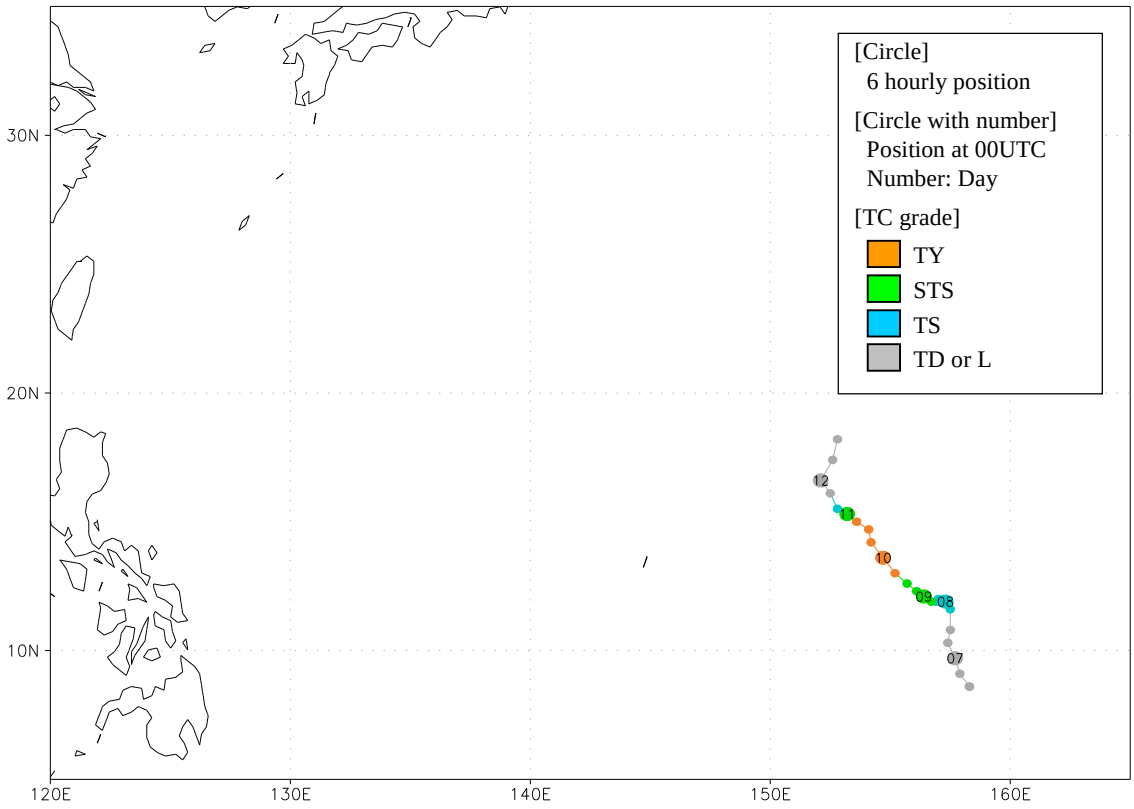
# MEKKHALA (1501)

MEKKHALA formed as a tropical depression (TD) over the sea east of the Yap Islands at 00 UTC on 13 January 2015 and moved westward. It was upgraded to tropical storm (TS) intensity over the same waters at 12 UTC the same day. Continuing westward, MEKKHALA reached its peak intensity with maximum sustained winds of 60 kt and a central pressure of 975 hPa east of Samar Island of the Philippines at 18 UTC on 16 January. Moving northwestward, it hit the island and the southern part of Luzon Island the next day. After weakening to TD intensity east of Luzon Island at 18 UTC on 18 January, MEKKHALA moved slowly eastward and dissipated over the same waters at 00 UTC on 21 January.



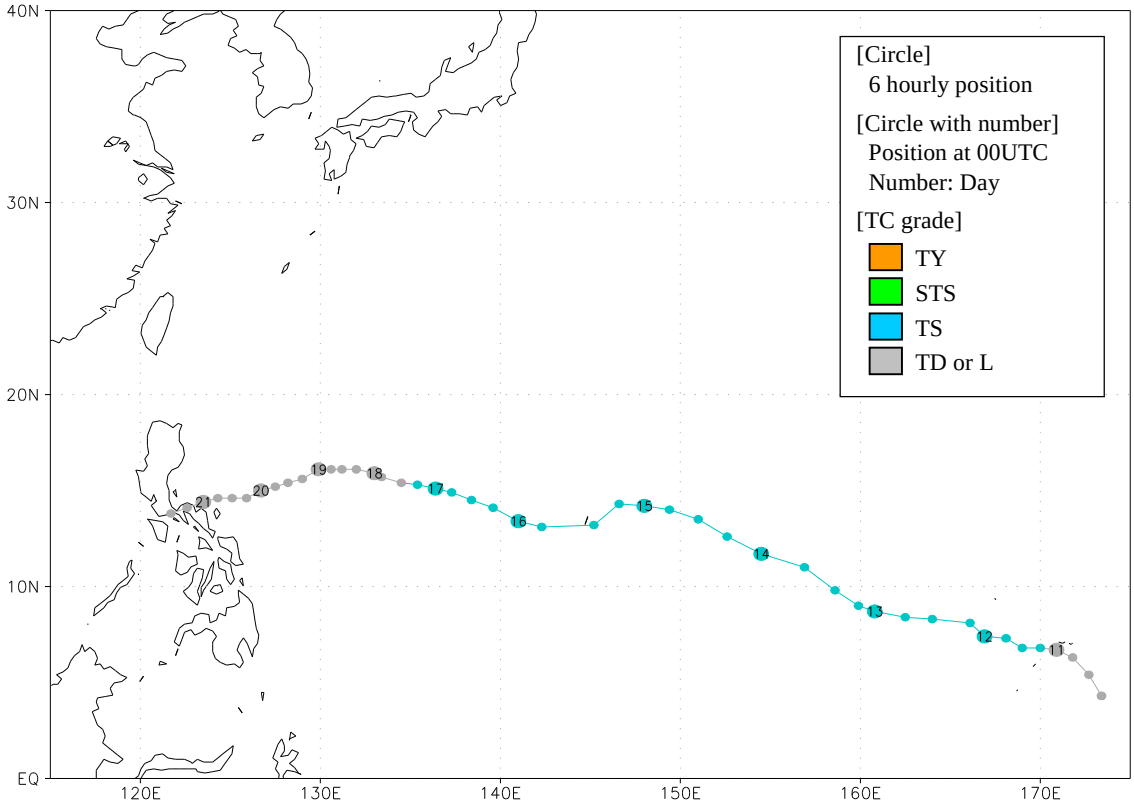
# HIGOS (1502)

HIGOS formed as a tropical depression (TD) north of Pohnpei Island at 12 UTC on 6 February 2015 and moved northward. It was upgraded to tropical storm (TS) intensity over the same waters at 18 UTC on 7 February. Moving northwestward, HIGOS was upgraded to typhoon (TY) intensity east of the Mariana Islands at 18 UTC on 9 February. After reaching its peak intensity with maximum sustained winds of 90 kt and a central pressure of 940 hPa at 06 UTC on 10 February, HIGOS rapidly weakened to TD intensity over the same waters at 12 UTC the next day. Turning northward on 12 February, it dissipated at 18 UTC the same day.



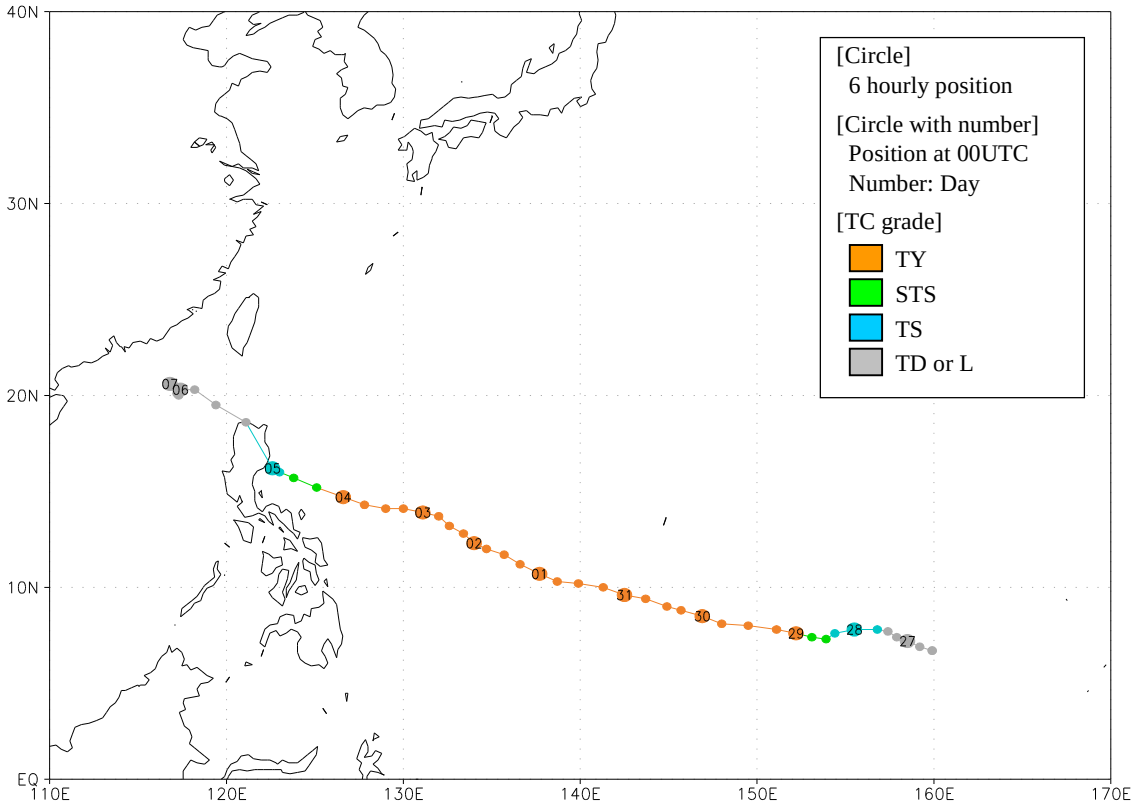
# BAVI (1503)

BAVI formed as a tropical depression (TD) around sea of the Marshall Islands at 06 UTC on 10 March 2015. Moving north-westward, it was upgraded to tropical storm (TS) intensity over the same waters at 06 UTC the next day. Keeping its westward track, BAVI reached its peak intensity with maximum sustained winds of 45 kt and a central pressure of 990hPa around sea north of Chuuk Islands at 18 UTC on 13 March. Moving westward, BAVI weakened to TD intensity around sea east of the Philippines at 12 UTC on 17 March, and BAVI dissipated around the Philippines at 18 UTC on 21 March.



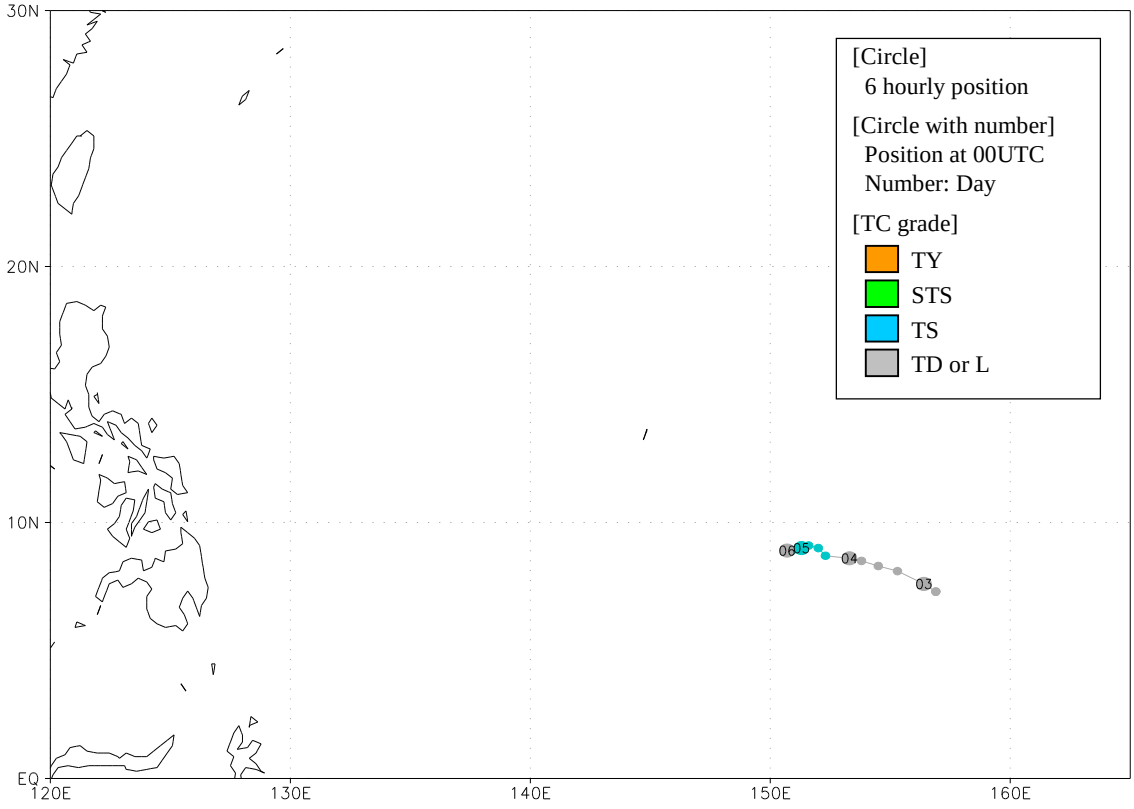
# MAYSAK (1504)

MAYSAK formed as a tropical depression (TD) over the sea east of Pohnpei Island at 12 UTC on 26 March 2015. Moving west-northwestward, it was upgraded to tropical storm (TS) intensity northwest of the island at 18 UTC the next day and turned westward. MAYSAK was upgraded to typhoon (TY) intensity around the Chuuk Islands at 00 UTC on 29 March. After turning west-northwestward, it reached its peak intensity with maximum sustained winds of 105 kt and a central pressure of 910 hPa east of the Yap Islands at 06 UTC on 31 March. MAYSAK kept its west-northwestward track and was downgraded to TS intensity on 18 UTC on 4 April before hitting Luzon Island. Crossing the island with TS intensity, it weakened to TD intensity around the northern coast of the island at 06 UTC the next day. MAYSAK dissipated west of the Luzon Strait at 06 UTC on 07 April.



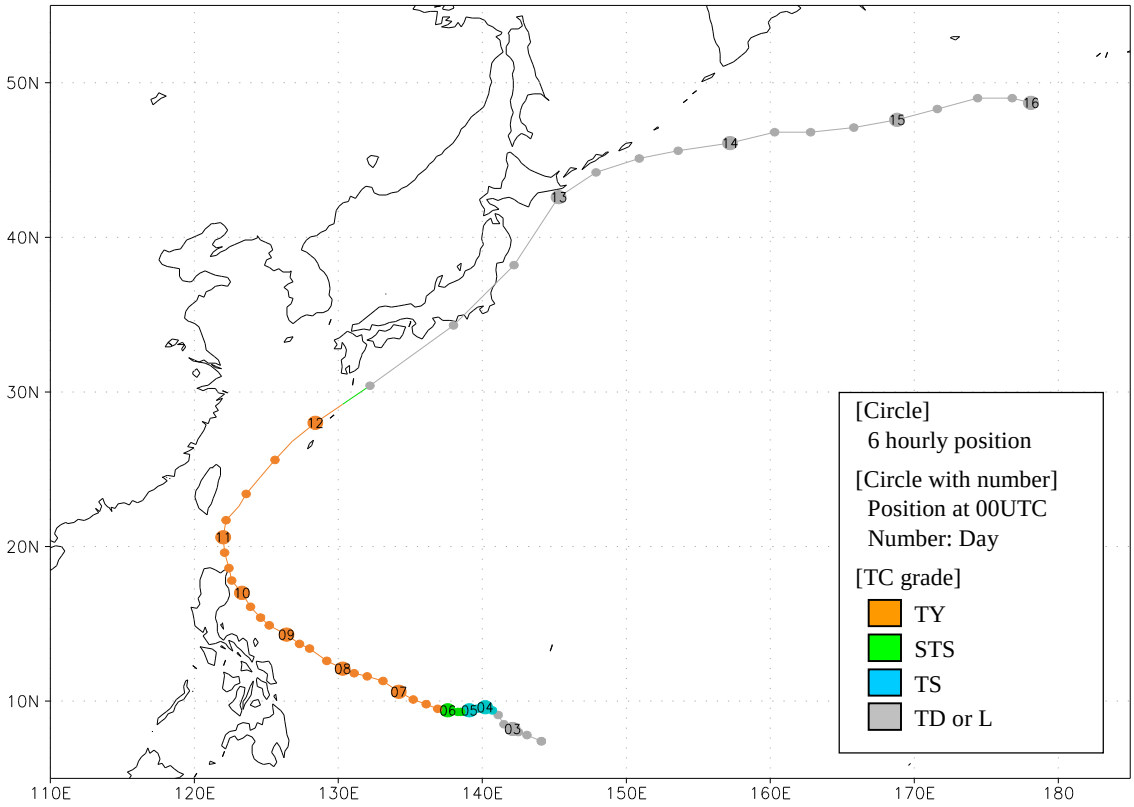
# HAISHEN (1505)

HAISHEN formed as a tropical depression (TD) over the sea northwest of Pohnpei Island at 18 UTC on 2 April 2015 and moved west-northwestward. It was upgraded to tropical storm (TS) intensity north of the Chuuk Islands at 06 UTC on 4 April. After turning northwestward, HAISHEN reached its peak intensity with maximum sustained winds of 35 kt and a central pressure of 998 hPa around the Islands at 18 UTC the same day. After turning west-southwestward, it weakened to TD intensity over the same waters at 12 UTC the next day and dissipated there at 06 UTC on 6 April.



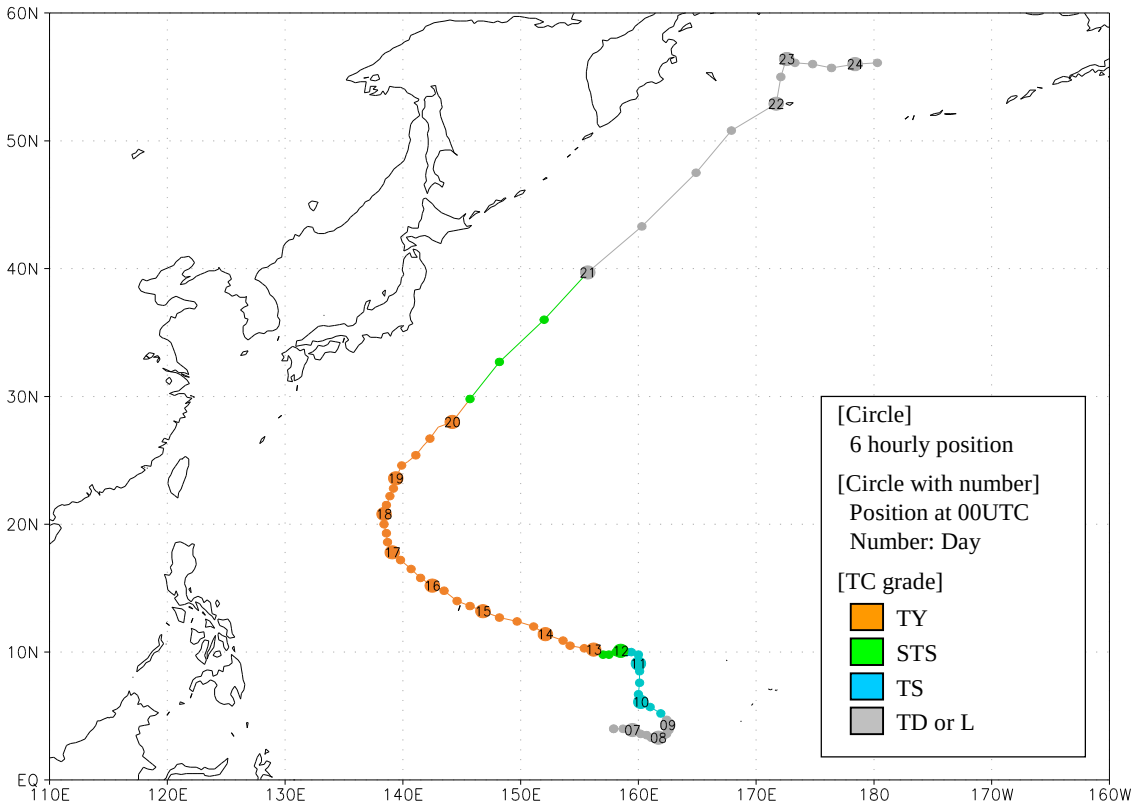
# NOUL (1506)

NOUL formed as a tropical depression (TD) around the Caroline Islands at 06 UTC on 02 May 2015. Moving west-northwestward, it was upgraded to tropical storm (TS) intensity east of Yap Island at 18 UTC on 3 May and upgraded to typhoon (TY) intensity just west of the same island at 06 UTC on 6 May. NOUL gradually turned northwestward and reached its peak intensity with maximum sustained winds of 110 kt and a central pressure of 920 hPa east of Luzon Island at 00 UTC on 10 May. Gradually turning northeastward, NOUL accelerated along Okinawa Islands and transformed into an extratropical cyclone at 06 UTC on 12 May east of Tanegashima Island. It continued moving east-northeastward until it dissipated four days later near the dateline.



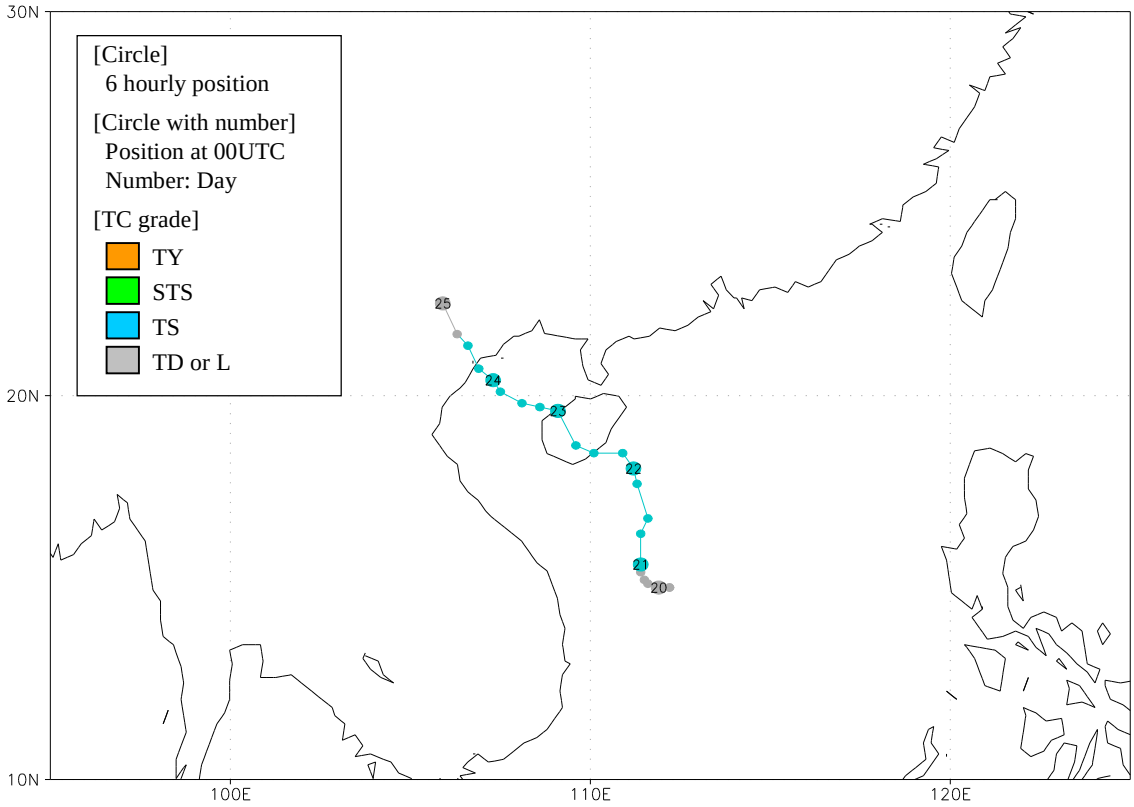
# DOLPHIN (1507)

DOLPHIN formed as a tropical depression (TD) over the sea south of Pohnpei Island at 12 UTC on 6 May 2015 and moved eastward. Turning northwestward, it was upgraded to tropical storm (TS) intensity east of the island at 12 UTC on 9 May. Moving northward and then turning westward, DOLPHIN was upgraded to typhoon (TY) intensity over the sea northwest of the island at 00 UTC on 13 May. It reached its peak intensity with maximum sustained winds of 100 kt and a central pressure of 925 hPa west of the Mariana Islands at 06 UTC on 16 May. Turning northeastward, DOLPHIN was downgraded to severe tropical storm (STS) intensity northeast of Chichijima Island at 06 UTC on 20 May. After accelerating northeastward, DOLPHIN transformed into an extratropical cyclone over the sea far east of Japan at 00 UTC the next day. Continuing northeastward, it crossed longitude 180 degrees east over the Bering Sea before 06 UTC on 24 May.



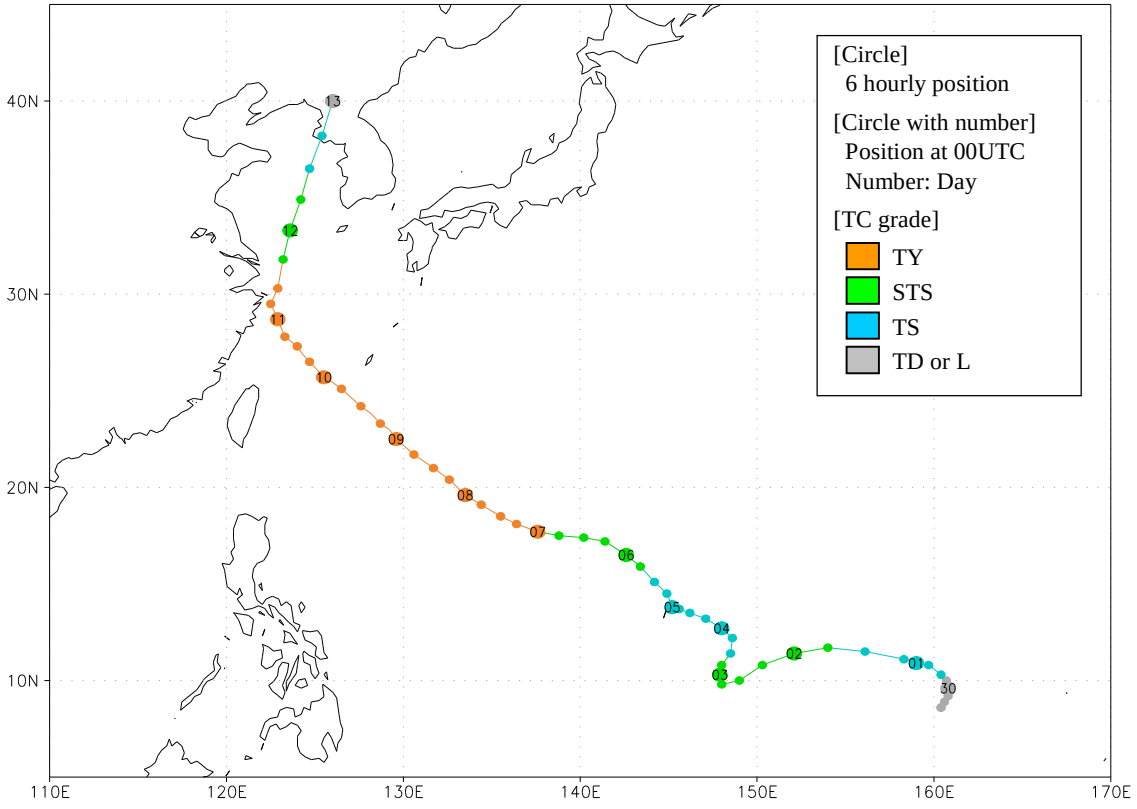
# KUJIRA (1508)

KUJIRA formed as a tropical depression (TD) south of the Paracel Islands at 18 UTC on 19 June 2015 and moved west-northwestward. Gradually turning northward, it was upgraded to tropical storm (TS) intensity west of the islands at 00 UTC on 21 June. KUJIRA reached its peak intensity with maximum sustained winds of 45 kt and a central pressure of 985 hPa over the same waters at 12 UTC the same day. KUJIRA turned westward and hit Hainan Island with TS intensity around 12 UTC on 22 June and weakened slowly. After crossing the island, it entered the Gulf of Tongking and temporarily developed. KUJIRA moved west-northwestward and hit the northeastern part of Vietnam with TS intensity after 06 UTC on 24 June. KUJIRA weakened to TD intensity there at 18 UTC the same day and dissipated twelve hours later.



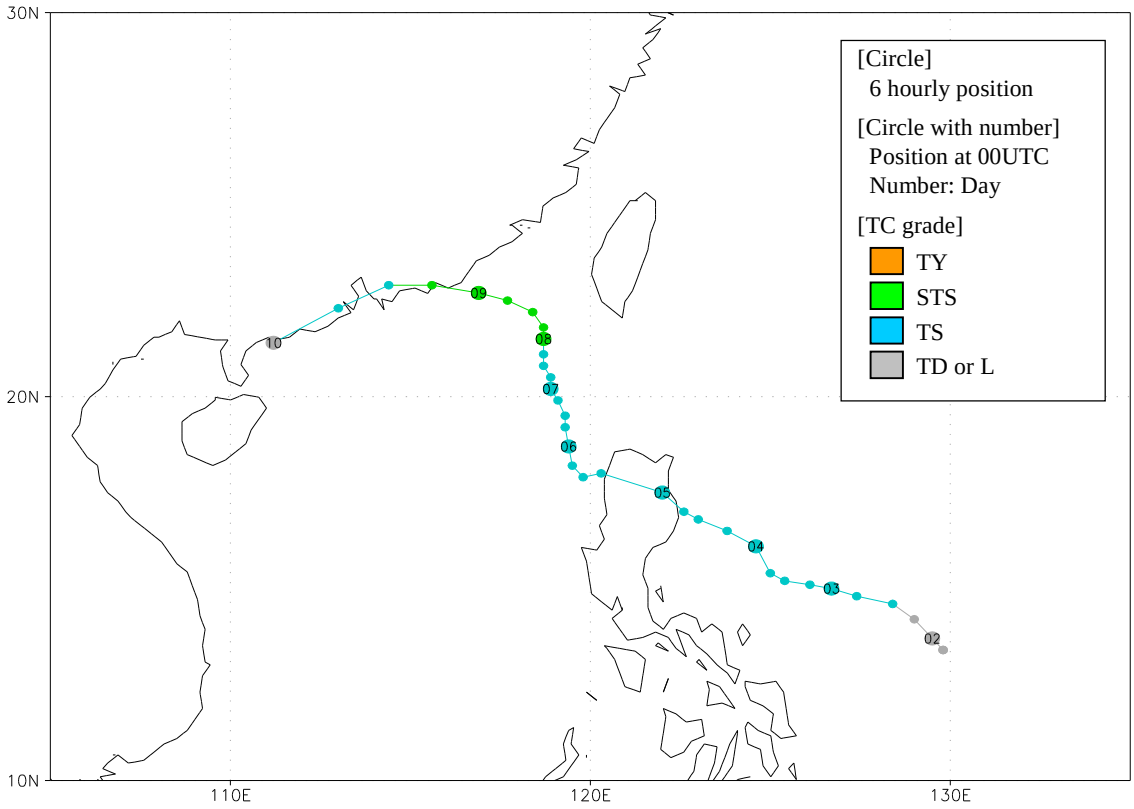
# CHAN-HOM (1509)

CHAN-HOM formed as a tropical depression (TD) around the Marshall Islands at 06 UTC on 29 June 2015. Moving north-northeastward then turning northwestward, CHAN-HOM was upgraded to tropical storm (TS) intensity around the Marshall Islands at 12 UTC on 30 June, and gradually turned west-southwestward. After moving toward north then turning northwestward, CHAN-HOM was upgraded to typhoon (TY) intensity southeast of Okinotorishima Island at 00 UTC on 07 July. CHAN-HOM reached its peak intensity with maximum sustained winds of 90 kt and a central pressure of 935 hPa around Miyakojima Island at 18 UTC on 09 July. Keeping its northwestward track, it passed between Miyakojima Island and Kumejima Island with TY intensity late on 9 July. After turning north-northeastward in the East China Sea, CHAN-HOM transformed into an extratropical cyclone in the northern part of the Korean Peninsula at 00 UTC on 13 July, and dissipated there at 15 UTC the same day.



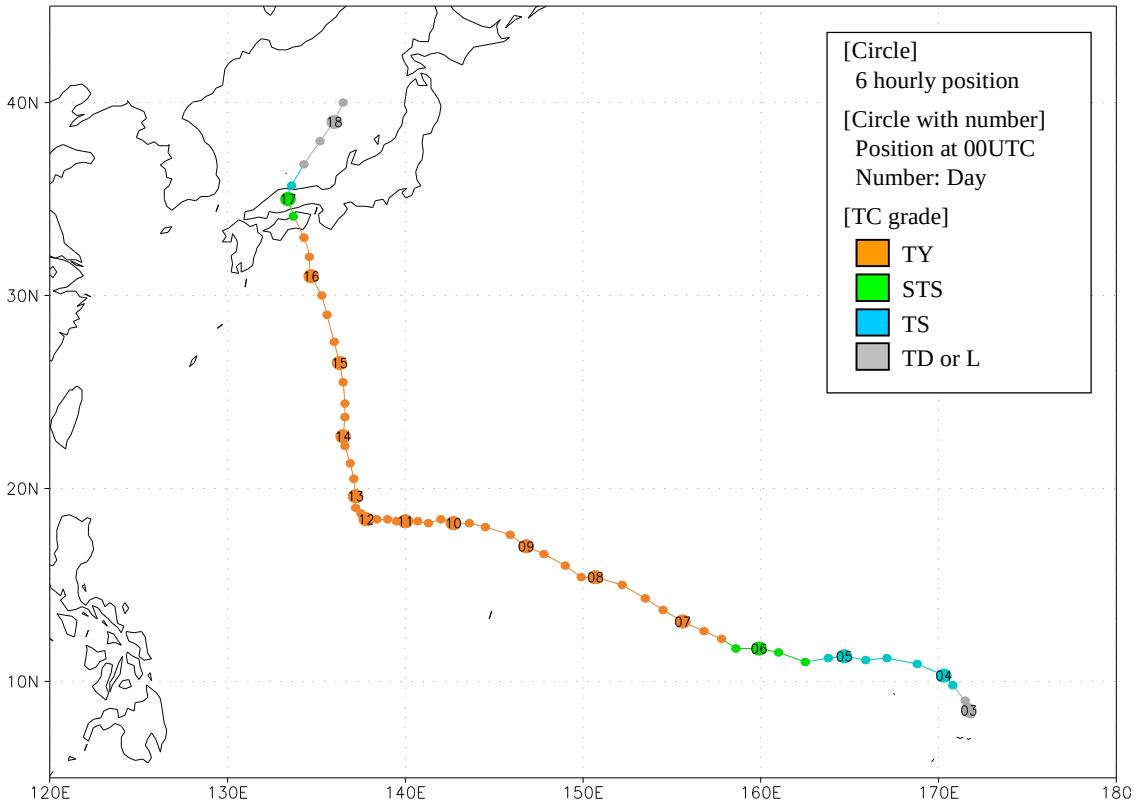
# LINFA (1510)

LINFA formed as a tropical depression (TD) east of the Philippines at 18 UTC on 1 July 2015 and moved northwestward. After upgrading to tropical storm (TS) intensity over the same waters at 12 UTC the next day, it moved west-northwestward with TS intensity and hit Luzon Island late on 4 July. After turning north-northwestward, LINFA upgraded to severe tropical storm (STS) intensity and reached its peak intensity with maximum sustained winds of 50 kt and a central pressure of 980 hPa southwest of Taiwan at 00 UTC on 8 July. After turning westward and hitting the southern part of China with STS intensity early on 9 July, it downgraded to TS intensity on 12 UTC the same day and weakened to TD intensity in the same area 12 hours later. LINFA dissipated in the southern part of China at 06 UTC on 10 July.



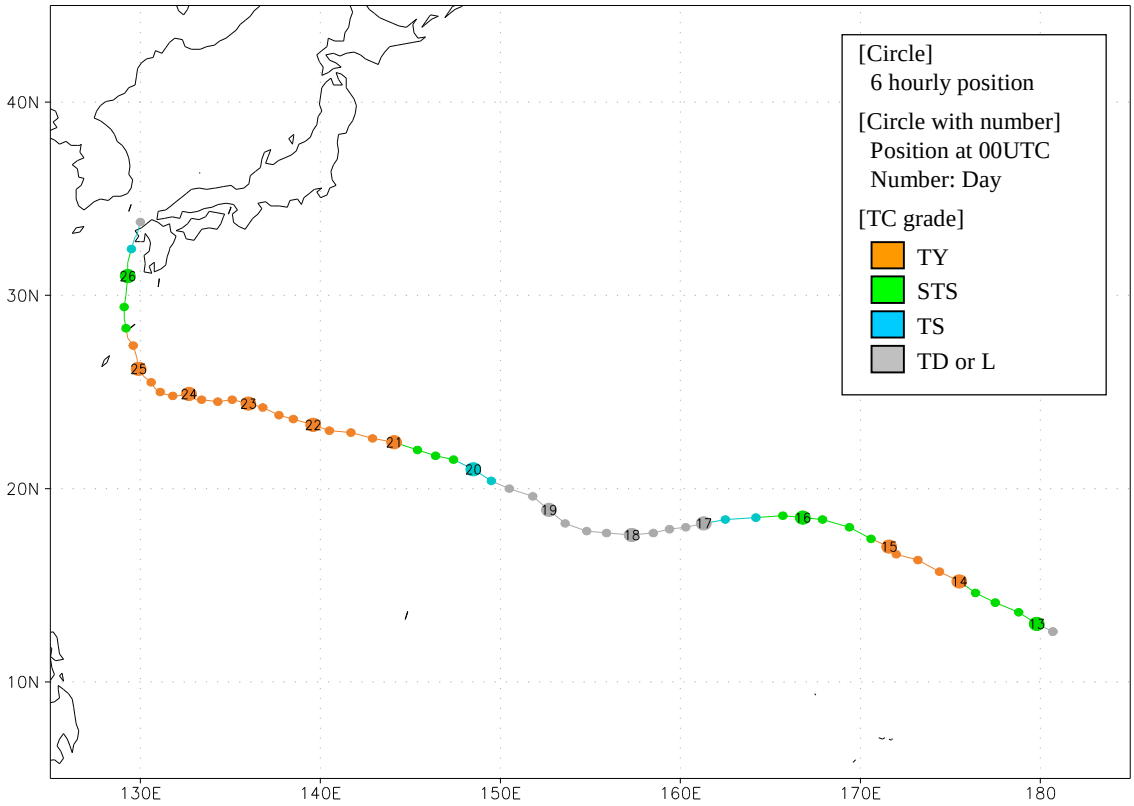
# NANGKA (1511)

NANGKA formed as a tropical depression (TD) over the sea around the Marshall Islands at 18 UTC on 02 July 2015 and moved northwestward. It was upgraded to tropical storm (TS) intensity over the same waters at 18 UTC the next day and NANGKA gradually turned westward. After turning northwestward it was upgraded to typhoon (TY) intensity north of Pohnpei Island at 12 UTC on 06 July. Keeping its northwestward track, NANGKA reached its peak intensity with maximum sustained winds of 100 kt and a central pressure of 925 hPa around the northern part of the Mariana Islands at 06 UTC on 9 July. After sharply turning north-northwestward over the sea south of Japan, NANGKA made landfall in Muroto City, Kouchi Prefecture with TY intensity around 14 UTC on 16 July. After passing Shikoku Island, it made landfall in Kurashiki City, Okayama Prefecture with STS intensity around 21 UTC the same day again. Turning northeastward, NANGKA weakened to TD intensity over the Sea of Japan at 12 UTC on 17 July and dissipated over the same waters at 12 UTC the next day.



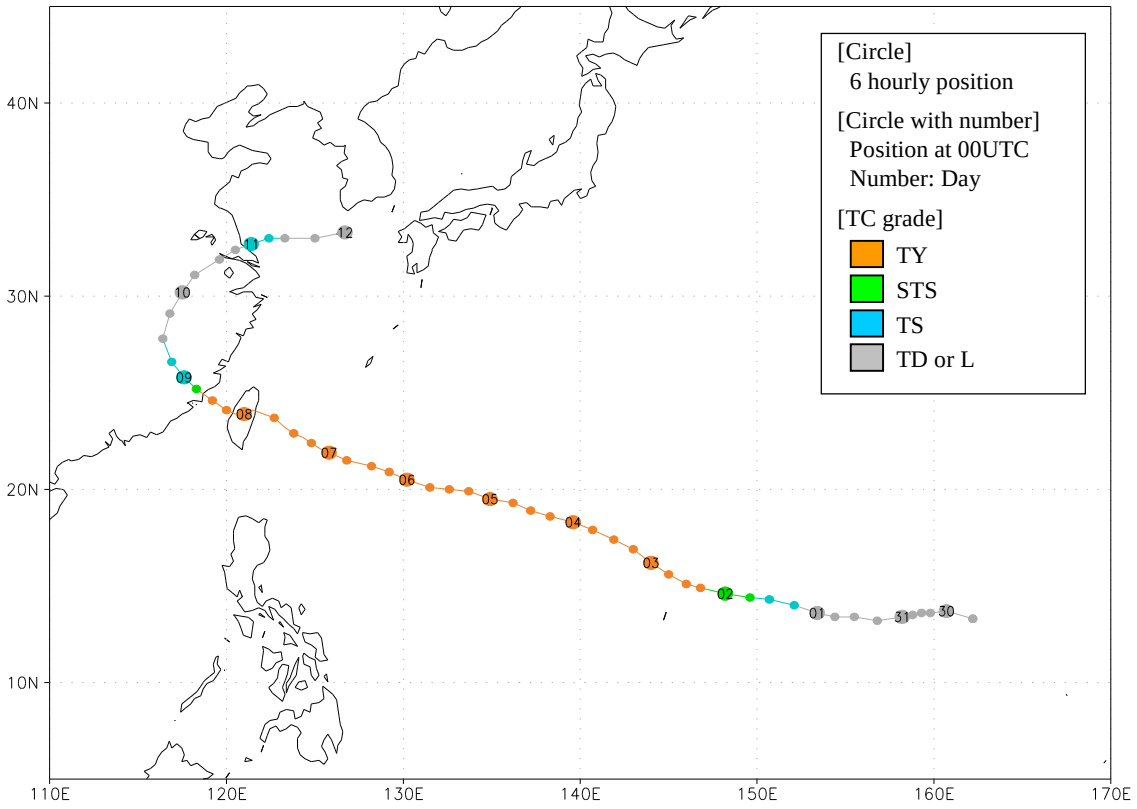
# HALOLA (1512)

HALOLA crossed longitude 180 degrees east with severe tropical storm (STS) intensity over the sea east of the Marshall Islands after 18 UTC on 12 July 2015 and entered the western North Pacific. Moving west-northwestward, it was upgraded to typhoon (TY) intensity northeast of the islands at 00 UTC on 14 July. Turning westward, HALOLA was downgraded to tropical storm (TS) intensity west of Wake Island at 12 UTC on 16 July and weakened to tropical depression (TD) intensity over the same waters 12 hours later. Turning west-northwestward, it developed again and was upgraded to TS intensity east of the Northern Mariana Islands at 18 UTC on 19 July. HALOLA was upgraded to TY intensity north of the islands at 00 UTC on 21 July and reached its peak intensity with maximum sustained winds of 80 kt and a central pressure of 955 hPa south of Iwoto Island 18 hours later. After turning northward and passing through the Amamigunto Islands with TY intensity, it was downgraded to TS intensity west of Kyushu Island at 06 UTC on 26 July. Keeping its northward track, HALOLA passed through Saikai City, Nagasaki Prefecture around 09 UTC and made landfall on Sasebo City, Nagasaki Prefecture around 10 UTC that day. Turning north-northeastward, it weakened to TD intensity over the northwestern part of Kyushu Island at 12 UTC that day and dissipated over the same area six hours later.



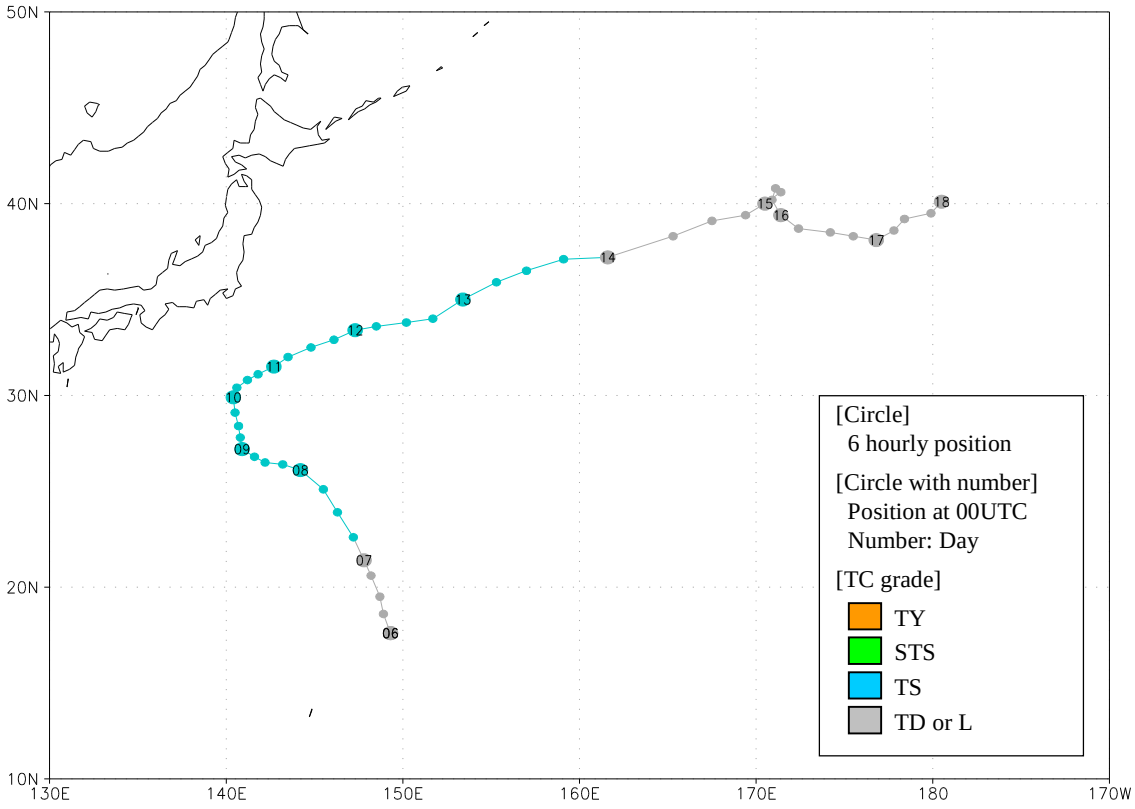
# SOUDELOR (1513)

SOUDELOR formed as a tropical depression (TD) northwest of the Marshall Islands at 18 UTC on 29 July 2015. Moving westward, SOUDELOR was upgraded to tropical storm (TS) intensity around the sea east of the Mariana Islands at 06 UTC on 1 August. Gradually turning west-northwestward, SOUDELOR was upgraded to typhoon (TY) intensity around the Mariana Islands at 06 UTC the next day. Keeping its west-northwestward track, SOUDELOR reached its peak intensity with maximum sustained winds of 115 kt and a central pressure of 900 hPa around the sea west of the Mariana Islands at 18 UTC on 3 August. After crossing Taiwan Island with TY intensity from 7 to 8 August, SOUDELOR weakened to TD intensity in the southern part of China at 12 UTC on 09 August, and gradually turned east-northeastward. SOUDELOR was upgraded to TS intensity again over the East China Sea at 00 UTC on 11 August, and then weakened to TD intensity over the same waters 12 hours later. Transforming into an extratropical cyclone over the same waters at 18 UTC on 11 August, SOUDELOR dissipated around Juju Island at 06 UTC the next day.



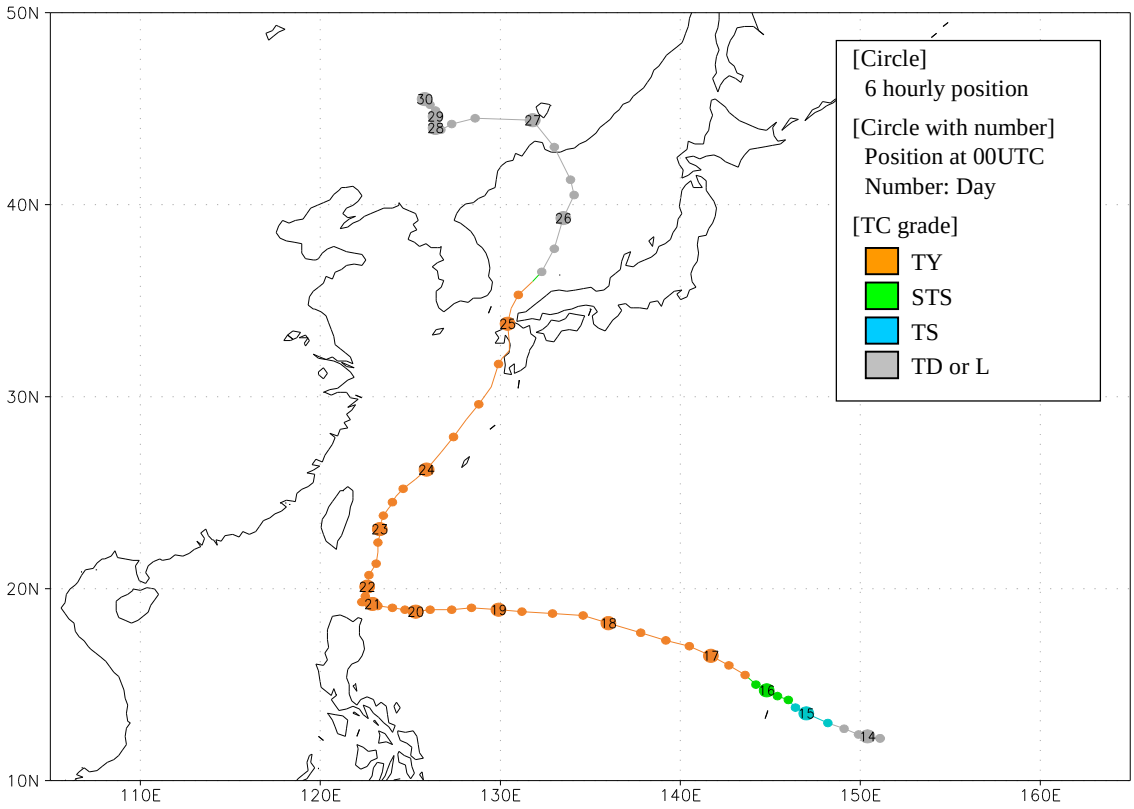
# MOLAVE (1514)

MOLAVE formed as a tropical depression (TD) over the sea east of the Mariana Islands at 00 UTC on 06 August 2015 and moved northward. Turning northwestward, it was upgraded to tropical storm (TS) intensity around southeast of the Ogasawara Islands at 06 UTC the next day. Turning northward, MOLAVE reached its peak intensity with maximum sustained winds of 45 kt and a central pressure of 985 hPa east of Torishima Island at 18 UTC on 10 August. MOLAVE accelerated northeastward and transformed into an extratropical cyclone far east of Japan at 00 UTC on 14 August. MOLAVE moved eastward and crossed longitude 180 degrees east at 00 UTC on 18 August.



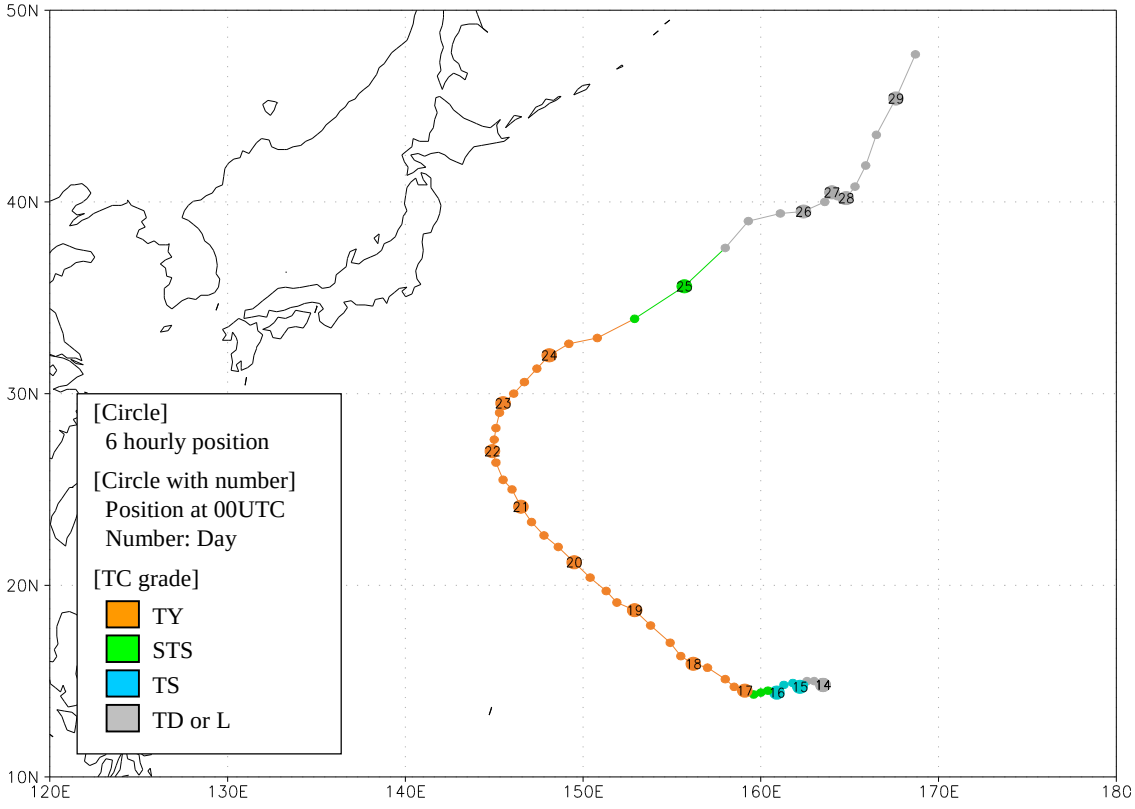
# GONI (1515)

GONI formed as a tropical depression (TD) east of the Mariana Islands at 18 UTC on 13 August 2015 and moved west-northwestward. Keeping its west-northwestward track, GONI was upgraded to tropical storm (TS) intensity east of Guam Island at 18 UTC on 14 August and was upgraded to typhoon (TY) intensity west of Saipan Island at 12 UTC two days later. It reached its peak intensity with maximum sustained winds of 95 kt and a central pressure of 935 hPa west of the Mariana Islands at 06 UTC on 17 August and gradually turned westward. After moving westward for more than three days, GONI turned sharply northward over the sea north of Luzon Island and passed through Iriomotejima Island around 10 UTC on 23 August. It turned northeastward and passed through Akune City, Kagoshima Prefecture after 19 UTC on 24 August. After GONI passed through Uki City, Kumamoto Prefecture after 20 UTC on 24 August, it made landfall in Arao City, Kumamoto Prefecture with TY intensity after 21 UTC the same day. GONI entered the Sea of Japan and transformed into an extratropical cyclone northwest of the Oki Islands at 12 UTC on 25 August. After moving northward over the same waters, it dissipated in Northeast China at 12 UTC on 30 August.



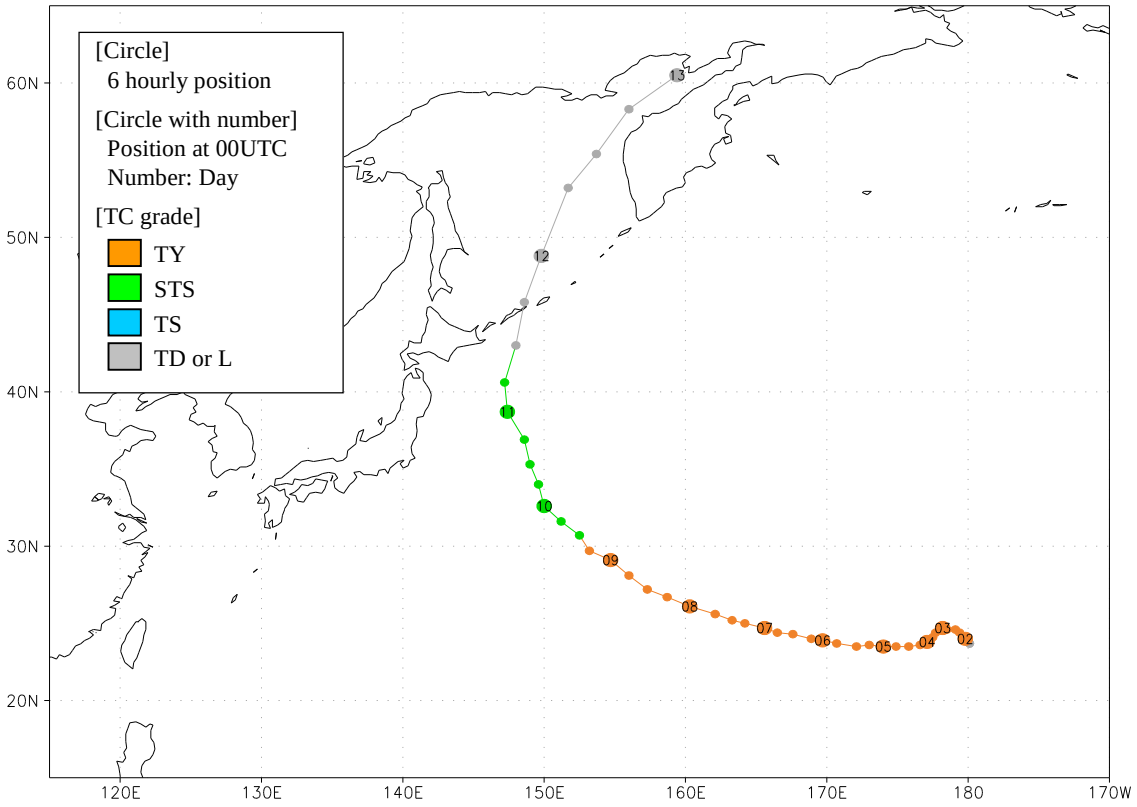
# ATSANI (1516)

ATSANI formed as a tropical depression (TD) northwest of the Marshall Islands at 00 UTC on 14 August 2015 and moved westward slowly. Keeping its westward track, ATSANI was upgraded to tropical storm (TS) intensity over the same waters at 18 UTC the same day. It was upgraded to typhoon (TY) intensity north of Pohnpei Island at 00 UTC on 17 August and turned northwestward. Moving northwestward, ATSANI reached its peak intensity with maximum sustained winds of 100 kt and a central pressure of 925 hPa east of the Mariana Islands at 00 UTC on 19 August. Keeping its northwestward track ATSANI passed over the sea east of the Ogasawara Islands and gradually turned northeastward. Accelerating northeastward over the sea far east of Japan, ATSANI transformed into an extratropical cyclone there at 06 UTC on 25 August. Keeping its northeastward track and gradually decelerating, ATSANI dissipated southeast of the Kamchatka Peninsula at 12 UTC on 29 August.



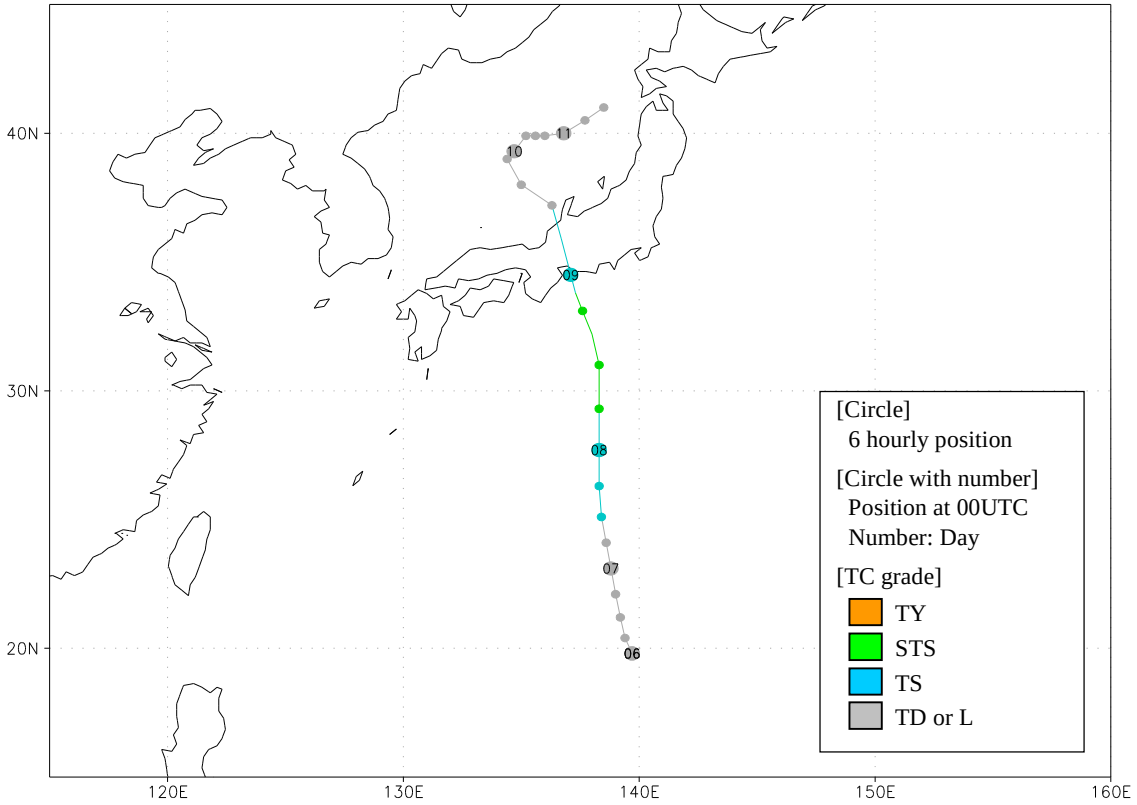
# KILO (1517)

KILO crossed longitude 180 degrees east with typhoon (TY) intensity over the sea northeast of Wake Island after 18 UTC on 1 September 2015 and entered the western North Pacific. Before crossing longitude 180 degrees east, it was in its peak intensity with maximum sustained winds of 90 kt and a central pressure of 945 hPa at 18 UTC on 1 September. Moving westward and turning gradually northwestward, KILO was downgraded to severe tropical storm (STS) intensity east of Japan at 12 UTC on 9 September. After turning north-northeastward, it transformed into an extratropical cyclone east of Hokkaido Island at 12 UTC on 11 September. After passing the Chishima Islands and entering the Sea of Okhotsk, KILO crossed latitude 60 degrees north before 00 UTC on 13 September.



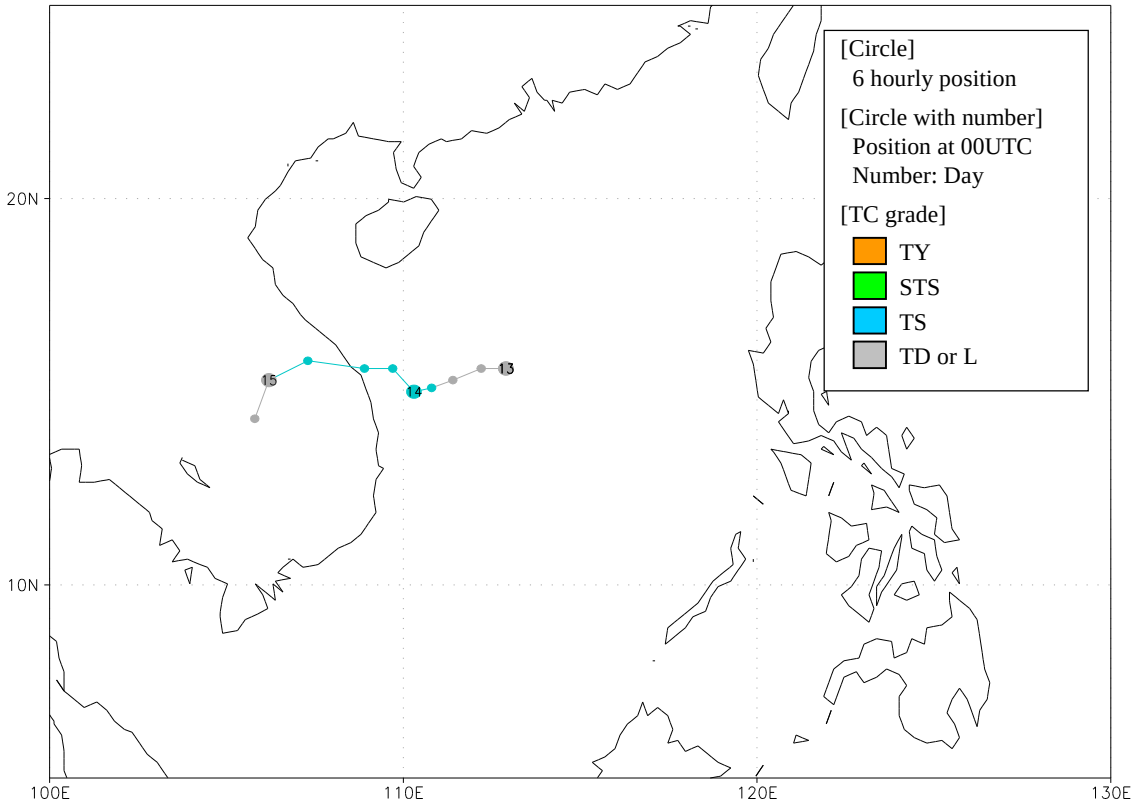
# ETAU (1518)

ETAU formed as a tropical depression (TD) east of Okinotorishima Island at 00 UTC on 06 September 2015. Moving north-northwestward, ETAU was upgraded to tropical storm (TS) intensity west of the Ogasawara Islands at 12 UTC on 07 September, and reached its peak intensity with maximum sustained winds of 50 kt and a central pressure of 985 hPa southwest of Torishima Island at 06 UTC on the next day. Just after passing through the Atsumi Peninsula in Aichi Prefecture after 00 UTC on 9 September, Etau made landfall on Nishio City in the same prefecture with TS intensity around 0030 UTC the same day. After crossing Honshu Island and entering the Sea of Japan, it transformed into an extratropical cyclone around the Noto Peninsula at 06 UTC on 9 September. Gradually turning northeastward, ETAU dissipated over the waters west of the Tsugaru Strait at 18 UTC on 11 September.



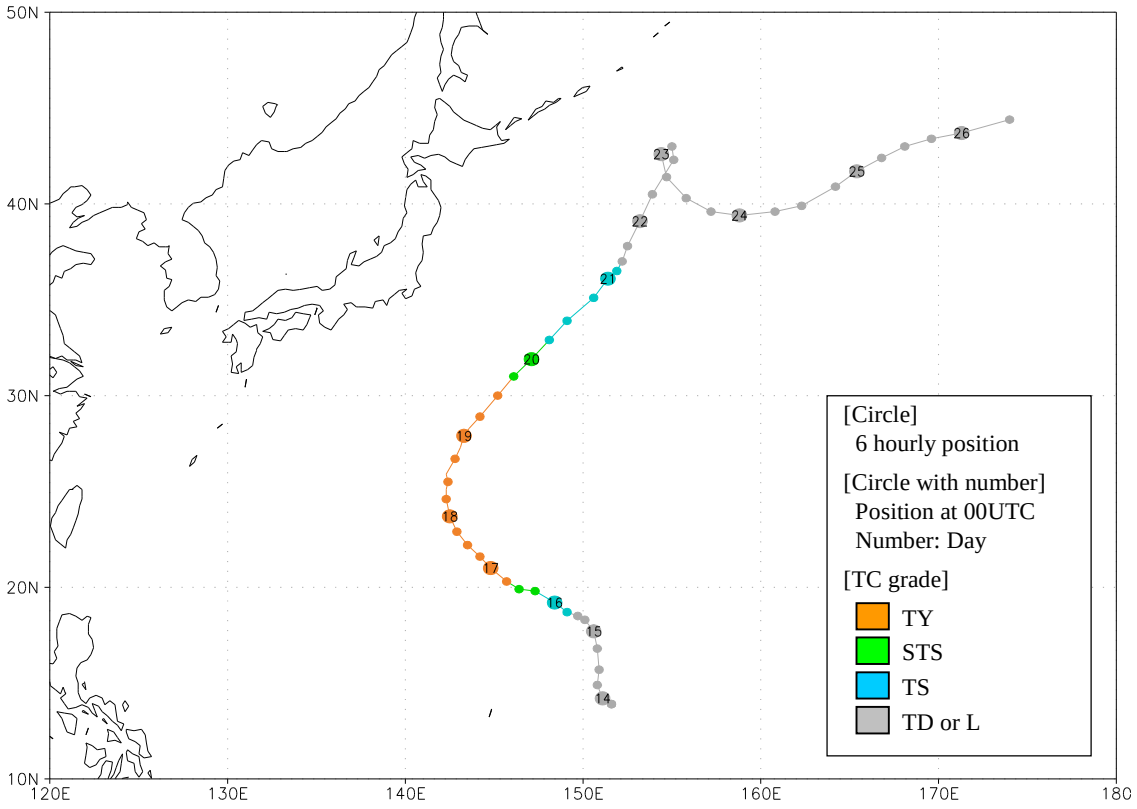
# VAMCO (1519)

VAMCO formed as a tropical depression (TD) over the South China Sea at 00 UTC on 13 September 2015 and moved westward. It was upgraded to tropical storm (TS) intensity over the sea east of Viet Nam at 18 UTC on same day. VAMCO reached its peak intensity with maximum sustained winds of 35 kt and a central pressure of 998 hPa over the same waters at 00 UTC the next day. After hitting Viet Nam late on 14 September, it weakened to TD intensity there at 00 UTC the next day and dissipated 12 hours later.



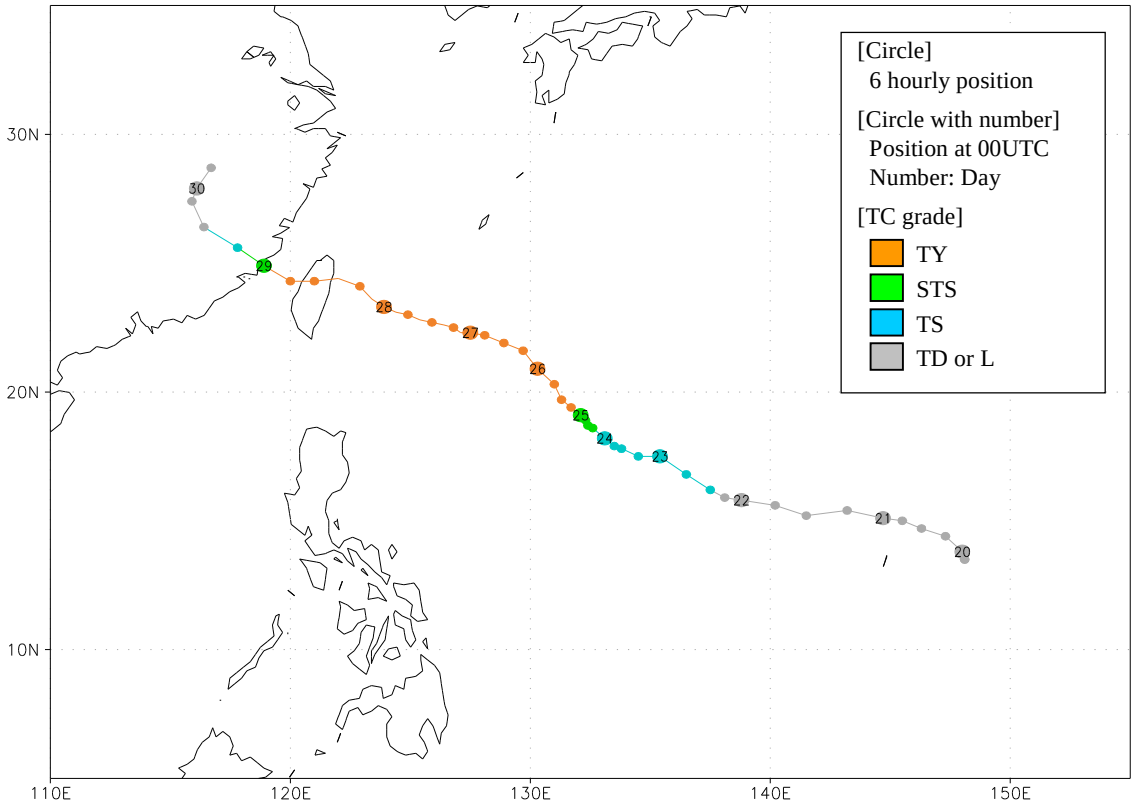
# KROVANH (1520)

KROVANH formed as a tropical depression (TD) east of Guam Island at 18 UTC on 13 September 2015 and moved northward. Turning northwestward, it was upgraded to tropical storm (TS) intensity east of the Northern Mariana Islands at 18 UTC on 15 September. Keeping its northwestward track, KROVANH was upgraded to typhoon (TY) intensity north of the Northern Mariana Islands at 18 UTC the next day and reached its peak intensity with maximum sustained winds of 85 kt and a central pressure of 945 hPa south of the Ogasawara Islands 18 hours later. After gradually turning northeastward, it was downgraded to TS intensity east of Hachijojima Island at 06 UTC on 20 September. Keeping its northeastward track, KROVANH transformed into an extratropical cyclone east of Japan at 12 UTC the next day and dissipated south of the Aleutian Islands at 12 UTC on 26 September.



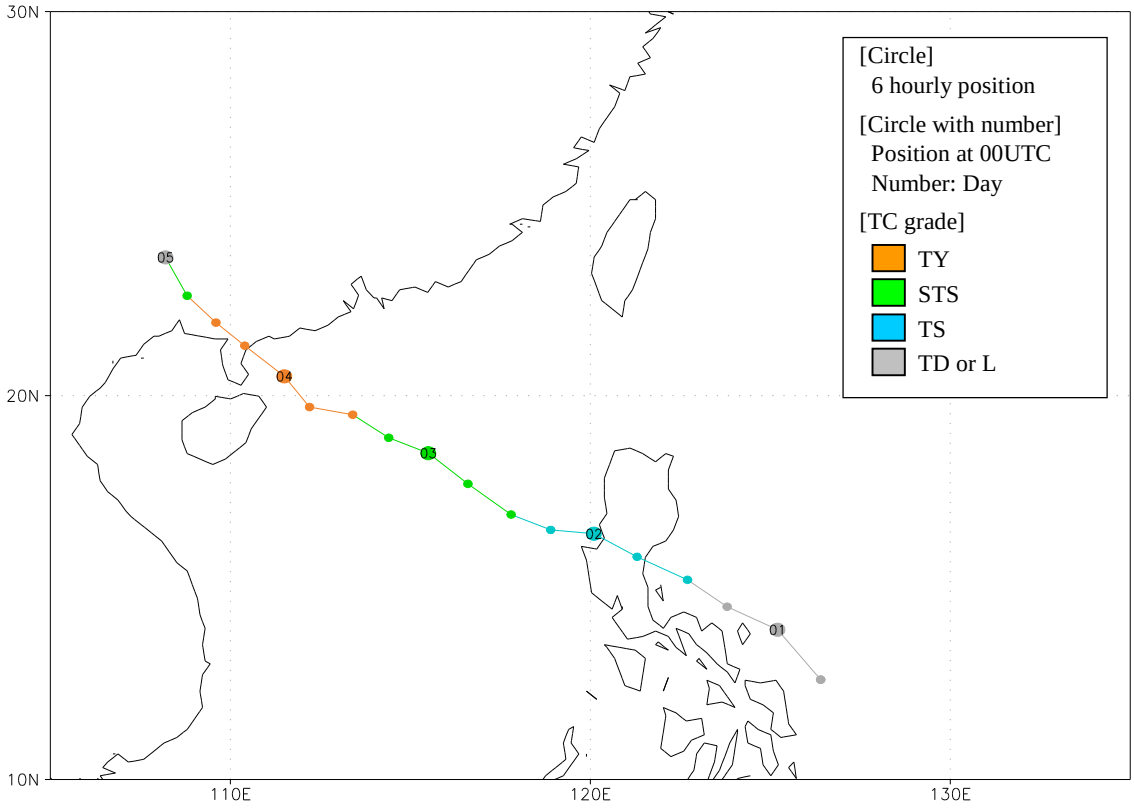
# DUJUAN (1521)

DUJUAN formed as a tropical depression (TD) east of Guam Island at 18 UTC on 19 September 2015. After moving westward, it gradually turned northwestward and was upgraded to tropical storm (TS) intensity south-southeast of Okinotorishima Island at 12 UTC on 22 September. Keeping its northwestward track, DUJUAN was upgraded to typhoon (TY) intensity west of Okinotorishima Island at 06 UTC on 25 September and reached its peak intensity with maximum sustained winds of 110 kt and a central pressure of 925 hPa southeast of Miyakojima Island at 00 UTC two days later. After turning westward, DUJUAN hit Taiwan Island with TY intensity after 09 UTC on 28 September and crossed the island. After it entered Taiwan Strait and turned northwestward. DUJUAN hit southeast coast of China with STS intensity around 00 UTC on 29 September. Moving northwestward, DUJUAN weakened to TD intensity in southern part of China 12 hours later. It dissipated in central part of China at 12 UTC on 30 September.



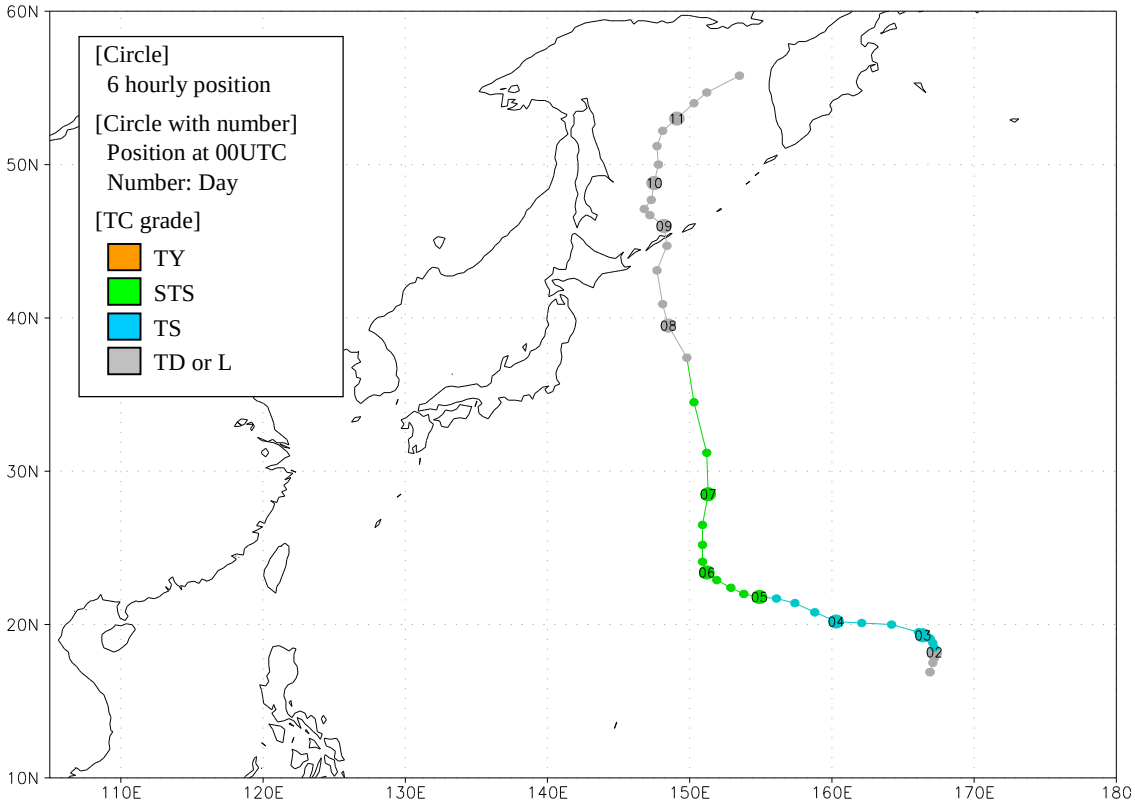
# MUJIGAE (1522)

MUJIGAE formed as a tropical depression (TD) over the sea east of the Philippines at 18 UTC on 30 September 2015. Moving northwestward, it was upgraded to tropical storm (TS) intensity off the eastern coast of Luzon Island at 12 UTC the next day and then crossed the island. Keeping its northwestward track, MUJIGAE was upgraded to typhoon (TY) intensity east of Hainan Island at 12 UTC on 3 October and reached its peak intensity with maximum sustained winds of 85 kt and a central pressure of 950 hPa 12 hours later. After hitting the southern part of China, it weakened to TD intensity over the same region at 00 UTC on 5 October and dissipated six hours later.



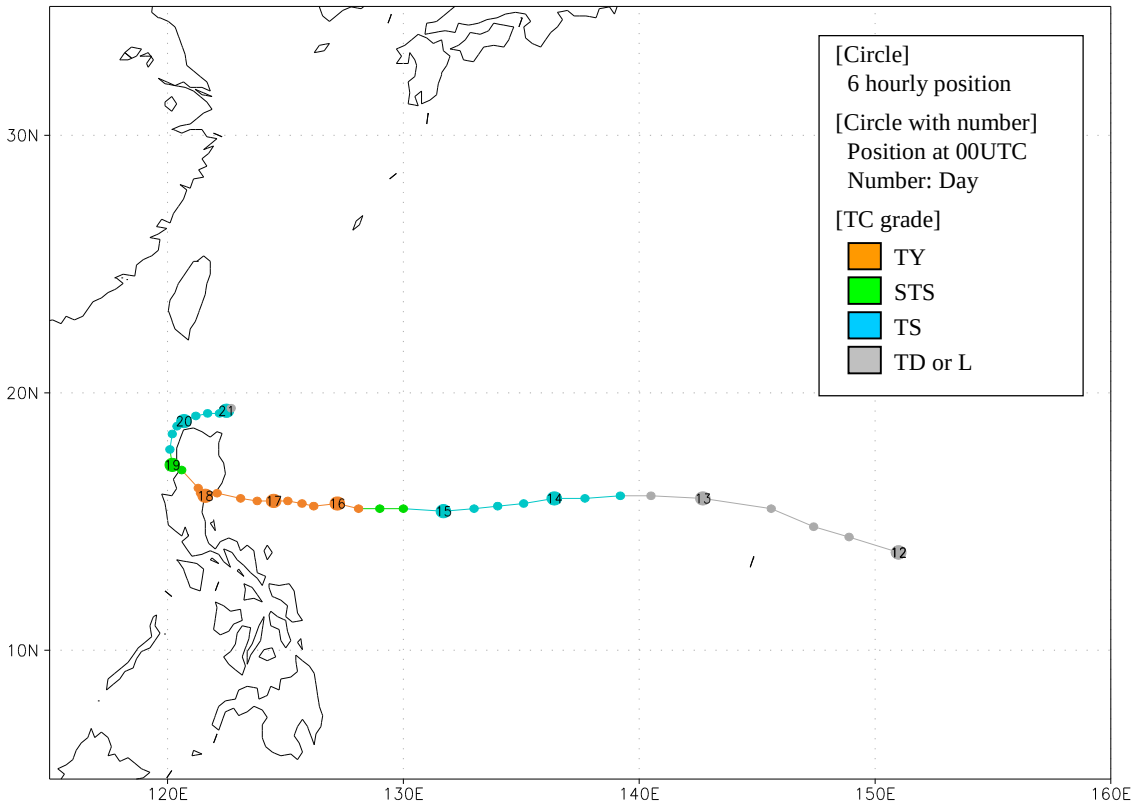
# CHOI-WAN (1523)

CHOI-WAN formed as a tropical depression (TD) south of Wake Island at 06 UTC on 01 October 2015. Moving northward, it was upgraded to tropical storm (TS) intensity around the same island at 06 UTC the next day. After turning westward, CHOI-WAN was upgraded to severe tropical storm (STS) intensity south-southeast of Minamitorishima Island at 00UTC on 5 October. It turned northward again and reached its peak intensity with maximum sustained winds of 60 kt and a central pressure of 965 hPa northwest of Minamitorishima Island at 00 UTC on 07 October. Keeping its northward track, CHOI-WAN transformed into an extratropical cyclone east of Japan at 18 UTC the same day, and dissipated west of the Kamchatka Peninsula at 00 UTC on 12 October.



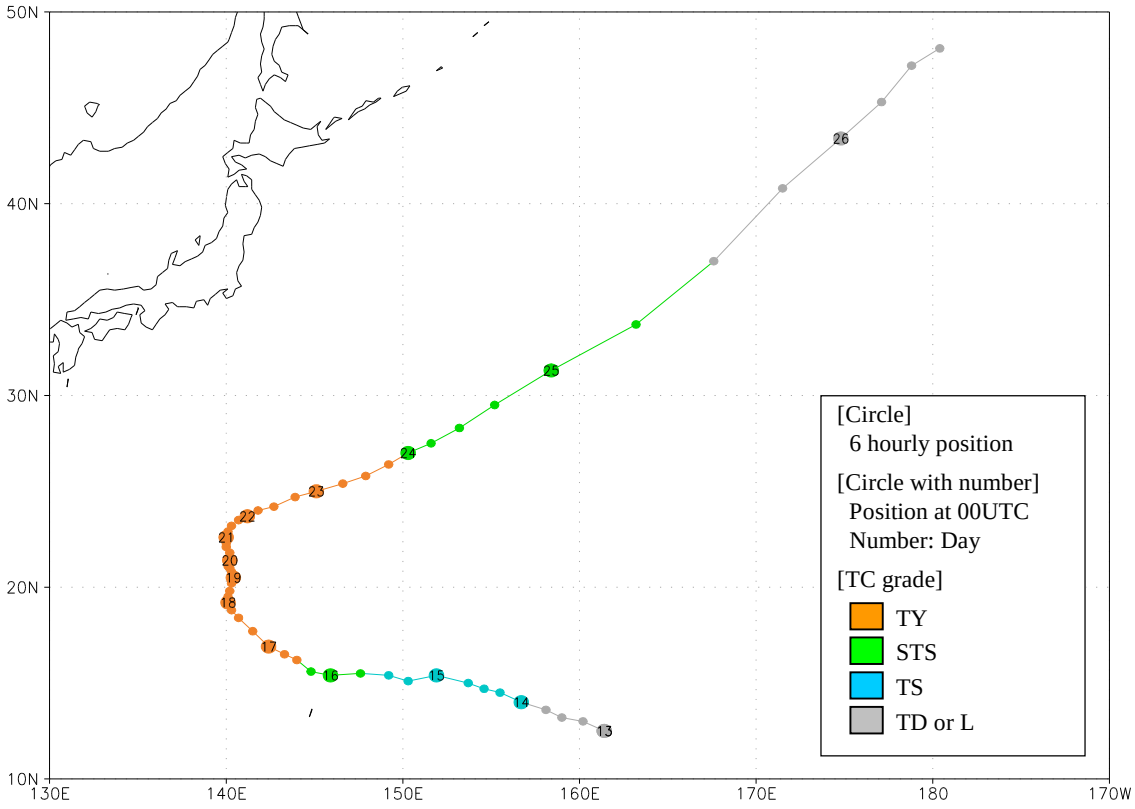
# KOPPU (1524)

KOPPU formed as a tropical depression (TD) over the sea east of Guam Island at 00 UTC on 12 October 2015. Moving west-northwestward, it was upgraded to tropical storm (TS) intensity west of the Northern Mariana Islands at 12 UTC the next day. Keeping its westward track, KOPPU was upgraded to typhoon (TY) intensity east of Luzon Island at 18 UTC on 15 October and reached its peak intensity with maximum sustained winds of 100 kt and a central pressure of 925 hPa off the eastern coast of the island at 18 UTC 17 October. After crossing Luzon Island and turning northwestward, it was downgraded to TS intensity off the western coast of the island at 06 UTC on 19 October. Turning gradually east-northeastward, KOPPU weakened to TD intensity off the northern coast of the island at 06 UTC on 21 October and dissipated six hours later.



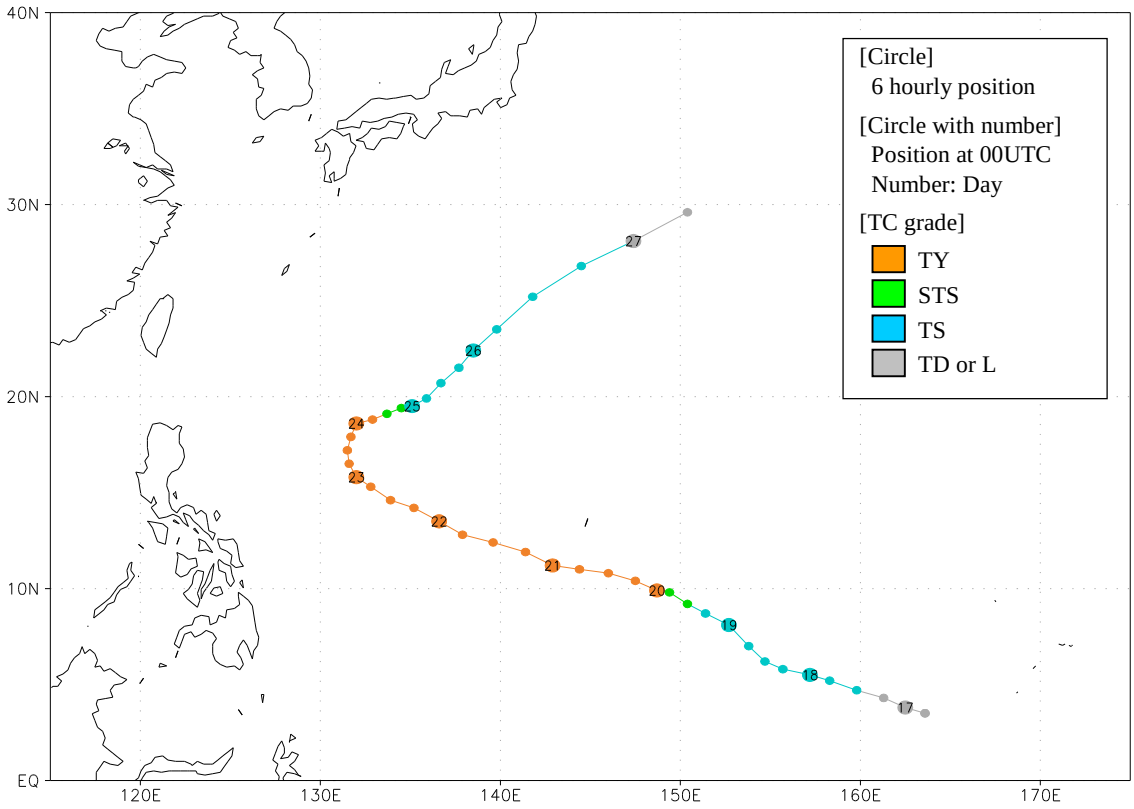
# CHAMPI (1525)

CHAMPI formed as a tropical depression (TD) northeast of Pohnpei Island at 00 UTC on 13 October 2015 and moved west-northwestward. Keeping its west-northwestward track, it was upgraded to tropical storm (TS) intensity north of the island at 00 UTC the next day. After turning northwestward, CHAMPI was upgraded to typhoon (TY) intensity northwest of Saipan Island at 12 UTC on 16 October. Decelerating northward, it reached its peak intensity with maximum sustained winds of 95 kt and a central pressure of 930 hPa east of Okinotorishima Island at 12 UTC on 18 October. After turning northeastward, CHAMPI was downgraded to severe tropical storm (STS) intensity northwest of Minamitorishima Island at 00 UTC on 24 October. Accelerating northeastward, it transformed into an extratropical cyclone far east of Japan at 12 UTC on 25 October and crossed longitude 180 degrees at 18 UTC the next day.



# IN-FA (1526)

IN-FA formed as a tropical depression (TD) over the sea southeast of Pohnpei Island at 18 UTC on 16 November 2015 and moved west-northwestward. It was upgraded to tropical storm (TS) intensity south of the island at 12 UTC the next day. Keeping its west-northwest track, IN-FA was upgraded to typhoon (TY) intensity southeast of Guam Island at 00 UTC on 20 November. It reached its peak intensity with maximum sustained winds of 95 kt and a central pressure of 935 hPa southwest of the island at 00 UTC the next day. After gradually turning northeastward over the sea east of the Philippines, IN-FA transformed into an extratropical cyclone east-northeast of Chichijima Island 00 UTC on 27 November. It dissipated over the same waters 12 hours later.



# MELOR (1527)

MELOR formed as a tropical depression (TD) over the sea near the Caroline Islands at 00 UTC on 10 December 2015. Moving west-northwestward, it was upgraded to tropical storm (TS) intensity south of the Yap Islands at 06 UTC the next day. Keeping its west-northwestward track, MELOR was upgraded to typhoon (TY) intensity east of the Philippines at 18 UTC on 12 December and reached its peak intensity with maximum sustained winds of 95 kt and a central pressure of 935 hPa off the northeastern coast of Samar Island at 00 UTC on 14 December. After crossing the central part of the Philippines, it was downgraded to TS intensity around Mindoro Island at 12 UTC on 16 December. MELOR weakened to TD intensity over the same waters at 00 UTC the next day and dissipated six hours later.