

**ESCAP/WMO Typhoon Committee**  
Fifty first Session  
26 February – 1 March 2019  
Guangzhou  
China

FOR PARTICIPANTS ONLY  
WRD/TC.51/6.1  
15 February 2019  
ENGLISH ONLY

## **REVIEW OF THE 2018 TYPHOON SEASON**

*(submitted by the RSMC Tokyo – Typhoon Center)*

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### **Action Proposed**

The Committee is invited to review the 2018 typhoon season.

### **APPENDIXES:**

- A) DRAFT TEXT FOR INCLUSION IN SESSION REPORT
- B) Review of the 2018 Typhoon Season

**APPENDIX A:**  
**DRAFT TEXT FOR INCLUSION IN THE SESSION REPORT**

**x.x. Summary of typhoon season in Typhoon Committee region**

- 1 The Committee noted with appreciation the review of the 2018 typhoon season provided by the RSMC Tokyo as provided in Appendix XX, whose summary is presented in paragraph xx(2) – xx(12).
- 2 In the western North Pacific and the South China Sea, 29 named tropical cyclones (TCs) formed in 2018, which was above the 30-year average, and 13 out of them reached typhoon (TY) intensity, whose ratio was smaller than the 30-year average.
- 3 Eighteen named TCs formed in summer (June to August), which ties with 1994 as the largest number of formation in summer since 1951. Among them, nine named TCs formed in August, which is the third largest number of formation in August after ten in 1960 and 1966. During the month, sea surface temperatures were above normal in the tropical Pacific east of 150°E. Enhanced cyclonic vorticity existed over the sea east of the Philippines where strong south-westerly winds due to the above-normal monsoon activity and easterly winds in the southern side of the Pacific High converged. Adding to these, upper cold lows cut off from the meandering subtropical jet stream in the central to eastern North Pacific repeatedly moved southward and westward. These factors are thought to have contributed to the large number of TC formation.
- 4 The number of TCs whose maximum sustained winds reached 105 kt (violent TY) was seven, which is the largest number on record since 1977. These TCs moved over the area where ocean and atmospheric conditions were favourable for the intensification of TCs, such as warm sea surface temperatures and weak vertical wind shear.
- 5 The mean genesis point of named TCs was 16.3°N and 137.2°E, which was almost the same as that of the 30-year average. The mean genesis point of named TCs formed in summer (June to August) was 19.5°N and 137.8°E, with almost no deviation from that of the 30-year summer average, and that of named TCs formed in autumn (September to November) was 12.3°N and 138.4°E, showing a south-southeastward deviation from that of the 30-year autumn average. The autumn deviation could be partly attributed to below-normal SSTs around the Philippines, above-normal SSTs in the tropical Pacific east of 150°E and associated convection anomalies.
- 6 The mean duration of TCs sustaining TS intensity or higher was 5.2 days, almost the same as that of the 30-year average (5.3 days). The mean duration of TCs sustaining TS intensity or higher formed in summer was 5.0 days, almost the same as that of the 30-year average (5.1 days), and the mean duration of TCs sustaining TS intensity or higher formed in autumn was 6.4 days, longer than that of the 30-year average (5.6 days). The longer duration in autumn is consistent with anomalies observed in the past El Nino events.
- 7 Three named TCs formed from January to March. Bolaven (1801) formed as TS over the South China Sea and Sanba (1802) formed to the east of the Palau Islands. These two TCs caused damage in the Philippines.
- 8 Four named TCs formed in June. Ewiniar (1804) formed around Hainan Island and caused damage in China including Hong Kong and Macao. Prapiroon (1807) formed around the sea south-southeast of Okinawa Island and affected the Republic of Korea.
- 9 Five named TCs formed in July. Maria (1808) formed over the sea around the Mariana Islands and caused damage in China. Son-tinh (1809) formed around the Luzon Strait and caused damage in China including Hong Kong and Macao, Viet Nam and Lao PDR. Ampil

(1810) formed over the sea east of the Philippines and hit China. Jongdari (1812) formed to the east of the Philippines, took an unusual track due to the interaction with an upper cold vortex and eventually hit Japan and China.

- 10 Nine named TCs formed in August. Shanshan (1813) formed over the sea east of the Mariana Islands and hit Japan. Yagi (1814) formed around the sea east of the Philippines and hit China. Leepi (1815) formed over the sea west of the Mariana Islands and hit Japan. Bebinca (1816) formed over the South China Sea east of Hainan Island and caused severe damage to China including Hong Kong and Macao, Viet Nam and Lao PDR. Hector (1817) entered the western North Pacific with TS intensity on 13 August. Rumbia (1818) formed over the East China Sea and caused severe damage to China. It also affected the Republic of Korea and the Democratic People's Republic of Korea. Soulik (1819) formed over the sea to the northwest of Guam Island and caused damage in the Republic of Korea and the Democratic People's Republic of Korea. Cimaron (1820) formed over the sea north of the Chuuk Islands and hit Japan. Jebi (1821) formed over the sea around the Marshall Islands and caused severe damage to Japan.
- 11 Four named TCs formed in September. Mangkhut (1822) formed over the sea around the Marshall Islands and caused severe damage to the Philippines, China including Hong Kong and Macao and Viet Nam, and affected Lao PDR and Thailand. Barijat (1823) formed over the South China Sea and hit China. Trami (1824) formed over the sea around the Mariana Islands and caused damage in Japan. Kong-rey (1825) formed over the sea to the southwest of Guam Island and caused damage in the Republic of Korea and the Democratic People's Republic of Korea.
- 12 Four named TCs formed in October and November. Yutu (1826) formed over the sea around the Marshall Islands and caused severe damage to the Philippines. Toraji (1827) formed over the South China Sea and caused severe damage to Viet Nam. Usagi (1829) also formed over the South China Sea and caused damage in Viet Nam.

## **APPENDIX B:**

### **Review of the 2018 Typhoon Season**

In the western North Pacific and the South China Sea, 29 named tropical cyclones (TCs) formed in 2018, which was above the 30-year average (25.6, averaged for 1981 – 2010 period), and 13 out of them reached typhoon (TY) intensity, whose ratio was smaller than the 30-year average (see Table 1).

A notable feature of the season is that eighteen named TCs formed in summer (June to August), which ties with 1994 as the largest number of formation in summer since 1951 when the statistical record on TC in RSMC Tokyo – Typhoon Center started (see Figure 1). Among them, nine named TCs formed in August, which is the third largest number of formation in August after ten in 1960 and 1966. During the month, sea surface temperature was above normal in the tropical Pacific east of 150°E. Enhanced cyclonic vorticity existed over the sea east of the Philippines where strong south-westerly winds due to the above-normal monsoon activity and easterly winds in the southern side of the Pacific High converged. Adding to these, upper cold lows cut off from the meandering subtropical jet stream in the central to eastern North Pacific repeatedly moved southward and westward. These factors are thought to have contributed to the large number of TC formation.

Another feature is that the number of TCs whose maximum sustained winds reached 105 kt (violent TY) was seven, which is the largest number on record since 1977. These TCs moved over the area where ocean and atmospheric conditions were favourable for the intensification of TCs, such as warm sea surface temperatures and weak vertical wind shear.

The mean genesis point of named TCs was 16.3°N and 137.2°E, which was almost the same as that of the 30-year average (16.3°N and 136.7°E) (see Figure 2). The mean genesis point of named TCs formed in summer (June to August) was 19.5°N and 137.8°E, with almost no deviation from that of the 30-year summer average (18.4°N and 135.9°E), and that of named TCs formed in autumn (September to November) was 12.3°N and 138.4°E, showing a south-southeastward deviation from that of the 30-year autumn average (15.9°N and 137.8°E). The autumn deviation could be partly attributed to below-normal SSTs around the Philippines, above-normal SSTs in the tropical Pacific east of 150°E and associated convection anomalies.

The mean duration of TCs sustaining TS intensity or higher was 5.2 days, almost the same as that of the 30-year average (5.3 days). The mean duration of TCs sustaining TS intensity or higher formed in summer was 5.0 days, almost the same as that of the 30-year average (5.1 days), and the mean duration of TCs sustaining TS intensity or higher formed in autumn was 6.4 days, longer than that of the 30-year average (5.6 days). The longer duration in autumn is consistent with anomalies observed in the past El Niño events.

Three named TCs formed from January to March (see yellow lines in Figure 3). Bolaven (1801) formed as TS over the South China Sea and Sanba (1802) formed to the east of the

Palau Islands. These two TCs caused damage in the Philippines.

Four named TCs formed in June (see red lines in Figure 3). Ewiniar (1804) formed around Hainan Island and caused damage in China including Hong Kong and Macao. Prapiroon (1807) formed around the sea south-southeast of Okinawa Island and affected the Republic of Korea.

Five named TCs formed in July (see green lines in Figure 3). Maria (1808) formed over the sea around the Mariana Islands and caused damage in China. Son-tinh (1809) formed around the Luzon Strait and caused damage in China including Hong Kong and Macao, Viet Nam and Lao PDR. Ampil (1810) formed over the sea east of the Philippines and hit China. Jongdari (1812) formed to the east of the Philippines, took an unusual track due to the interaction with an upper cold vortex and eventually hit Japan and China.

Nine named TCs formed in August (see blue lines in Figure 3). Shanshan (1813) formed over the sea east of the Mariana Islands and affected Japan. Yagi (1814) formed around the sea east of the Philippines and hit China. Leepi (1815) formed over the sea west of the Mariana Islands and hit Japan. Bebinca (1816) formed over the South China Sea east of Hainan Island and caused severe damage to China including Hong Kong and Macao, Viet Nam and Lao PDR. Hector (1817) entered the western North Pacific with TS intensity on 13 August. Rumbia (1818) formed over the East China Sea and caused severe damage to China. It also affected the Republic of Korea and the Democratic People's Republic of Korea. Soulik (1819) formed over the sea to the northwest of Guam Island and caused damage in the Republic of Korea and the Democratic People's Republic of Korea. Cimaron (1820) formed over the sea north of the Chuuk Islands and hit Japan. Jebi (1821) formed over the sea around the Marshall Islands and caused severe damage to Japan.

Four named TCs formed in September (see purple lines in Figure 3). Mangkhut (1822) formed over the sea around the Marshall Islands and caused severe damage to the Philippines, China including Hong Kong and Macao and Viet Nam, and affected Lao PDR and Thailand. Barijat (1823) formed over the South China Sea and hit China. Trami (1824) formed over the sea around the Mariana Islands and caused damage in Japan. Kong-rey (1825) formed over the sea to the southwest of Guam Island and caused damage in the Republic of Korea and the Democratic People's Republic of Korea.

Four named TCs formed in October and November (see orange lines in Figure 3). Yutu (1826) formed over the sea around the Marshall Islands and caused severe damage to the Philippines. Toraji (1827) formed over the South China Sea and caused severe damage to Viet Nam. Usagi (1829) also formed over the South China Sea and caused damage in Viet Nam.

Table 1 List of named TCs in 2018

Tropical Cyclone	Duration (UTC) (TS or higher)		Minimum Central Pressure			Max Wind (kt)		
			(UTC)	lat (N)	long (E)		(hPa)	
TS Bolaven (1801)	030000	Jan - 040000	Jan	10.4	116.0	1002	35	
TS Sanba (1802)	110600	Feb - 130600	Feb	6.8	135.8	1000	35	
TY Jelawat (1803)	250600	Mar - 010000	Apr	16.2	138.1	915	105	
TS Ewiniar (1804)	050000	Jun - 081800	Jun	20.1	110.4	998	40	
STS Maliksi (1805)	071800	Jun - 111800	Jun	25.0	130.7	970	60	
TS Gaemi (1806)	150000	Jun - 170000	Jun	26.8	128.9	990	45	
TY Prapiroon (1807)	290000	Jun - 040600	Jul	30.7	127.8	960	65	
TY Maria (1808)	041200	Jul - 111800	Jul	21.8	133.5	915	105	
TS Son-tinh (1809)	170000	Jul - 190000	Jul	19.0	113.6	994	40	
STS Ampil (1810)	181200	Jul - 231200	Jul	22.3	131.2	985	50	
STS Wukong (1811)	231200	Jul - 270000	Jul	32.7	158.2	990	50	
TY Jongdari (1812)	241200	Jul - 030000	Aug	25.0	142.4	960	75	
TY Shanshan (1813)	030000	Aug - 100600	Aug	22.5	147.7	970	70	
TS Yagi (1814)	080000	Aug - 130000	Aug	25.0	126.8	990	40	
STS Leepi (1815)	111200	Aug - 150000	Aug	26.5	138.6	994	50	
TS Bebinca (1816)	130000	Aug - 170600	Aug	20.1	107.9	985	45	
TS Hector (1817)	131800	Aug - 151200	Aug	25.8	178.9	998	40	
TS Rumbia (1818)	150600	Aug - 180000	Aug	30.5	122.9	985	45	
TY Soulik (1819)	160000	Aug - 241800	Aug	27.0	133.3	950	85	
TY Cimaron (1820)	181200	Aug - 241200	Aug	25.5	138.8	950	85	
TY Jebi (1821)	271800	Aug - 050000	Sep	17.9	144.2	915	105	
TY Mangkhut (1822)	071200	Sep - 170600	Sep	13.7	138.7	905	110	
TS Barijat (1823)	110000	Sep - 130600	Sep	20.7	118.0	998	40	
TY Trami (1824)	210600	Sep - 010000	Oct	241800	19.6	129.1	915	105
TY Kong-rey (1825)	290600	Sep - 061200	Oct	011200	16.8	134.4	900	115
TY Yutu (1826)	220000	Oct - 020600	Nov	241200	14.7	146.2	900	115
TS Toraji (1827)	170600	Nov - 180000	Nov	170600	10.9	111.3	1004	35
TY Man-yi (1828)	201800	Nov - 270600	Nov	241200	18.7	136.2	960	80
STS Usagi (1829)	220000	Nov - 260000	Nov	240000	9.7	109.5	990	60

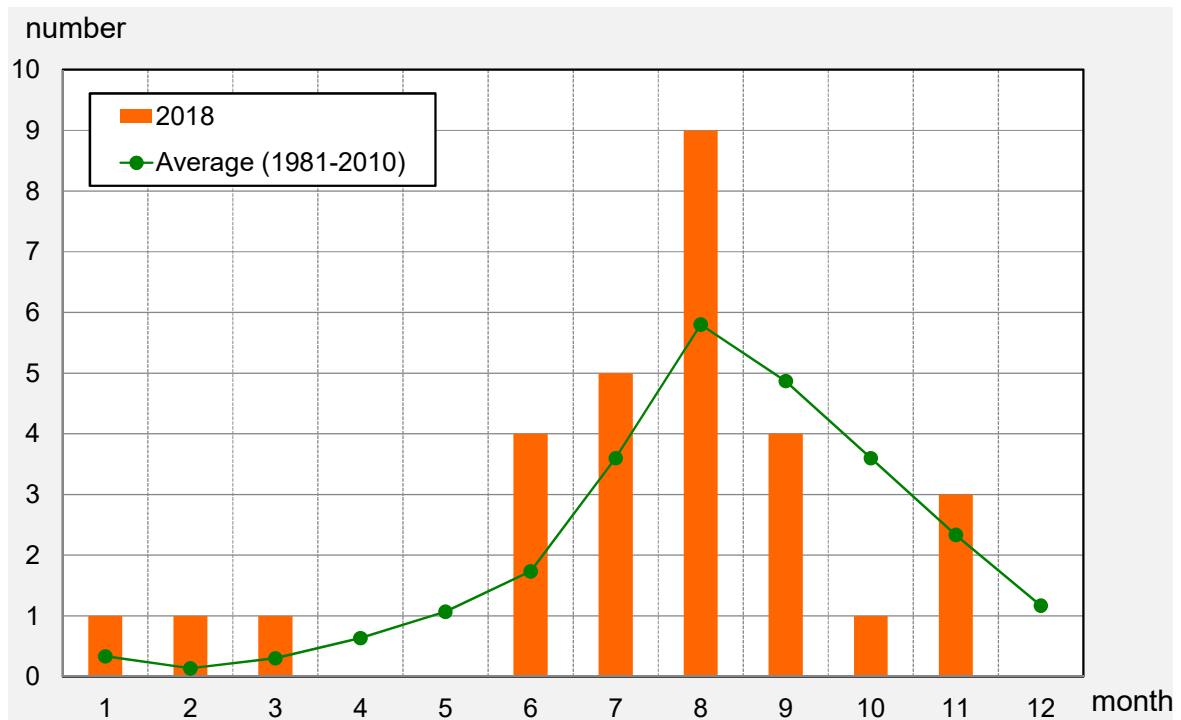


Figure 1 Monthly formation number of named TCs in 2018

Orange bar: formation number in 2018, green line: 30-year average from 1981 to 2010

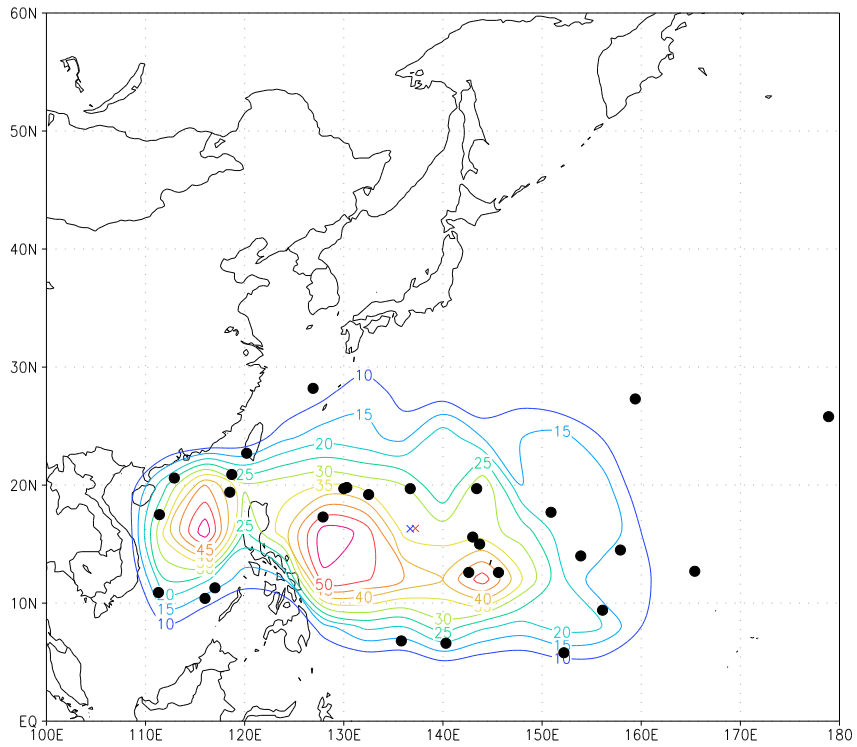


Figure 2 Genesis points of named TCs in 2018 (dots) and frequency distribution of genesis points for 1951-2017 (lines)  
 Red and blue crosses show the mean genesis points of named TCs in 2018 and the 30-year average period (1981 – 2010), respectively.

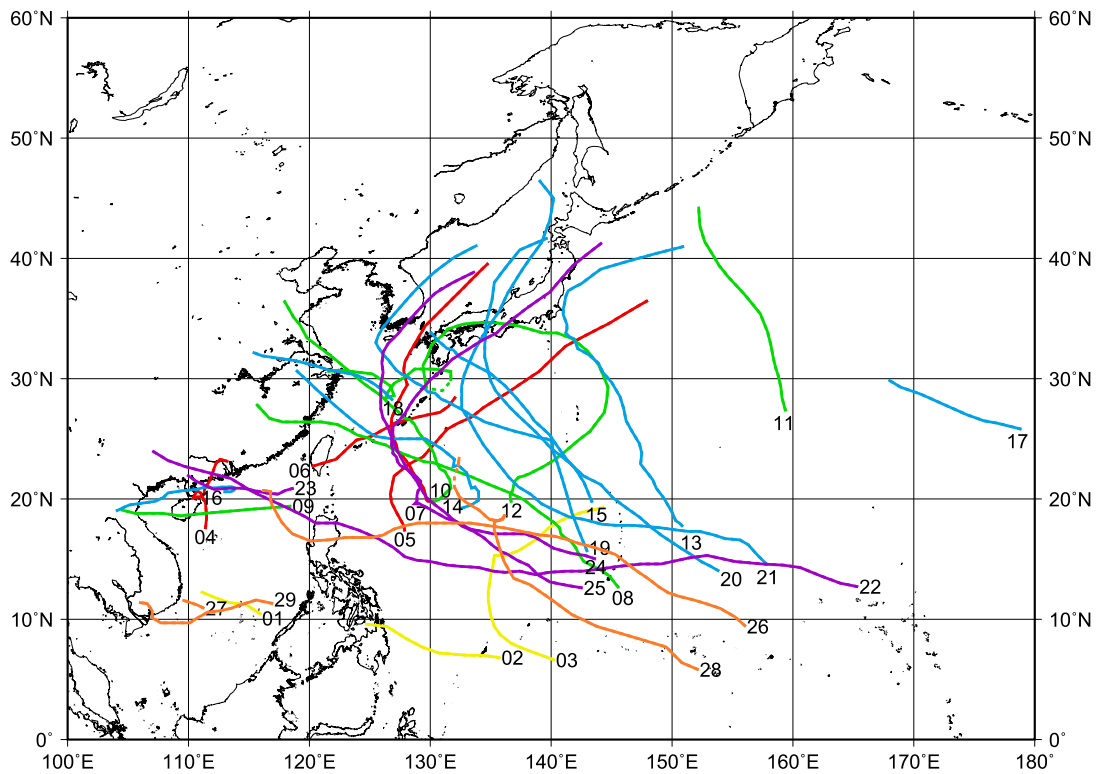


Figure 3 Tracks of named TCs in 2018  
 The numbers represent the genesis points of named TCs (the last two digits of their identification numbers) and dotted line shows the duration of tropical depression.

## **Narrative Accounts of the 29 Named Tropical Cyclones in 2018**

### **TS BOLAVEN (1801)**

BOLAVEN formed as a tropical depression (TD) over the sea around the Caroline Islands at 18 UTC on 29 December 2017. Moving westward and hitting Mindanao Island with TD intensity after 12 UTC on 1 January 2018, BOLAVEN crossed the Sulu Sea and turned west-northwestward over the South China Sea after 12 UTC on 2 January. It was upgraded tropical storm (TS) intensity and reached its peak intensity with maximum sustained winds of 35 kt and a central pressure of 1002 hPa at 00 UTC on 3 January. BOLAVEN weakened to TD intensity over the sea east of Viet Nam at 00 UTC on 4 January and dissipated there at 12 UTC the same day.

### **TS SANBA (1802)**

SANBA formed as a tropical depression (TD) around the Chuuk Islands at 00 UTC on 8 February 2018. It moved northwestward and turned west-southwestward. SANBA was upgraded to tropical storm (TS) intensity and reached its peak intensity with maximum sustained winds of 35 kt and a central pressure of 1000 hPa east of the Palau Islands at 06 UTC on 11 February. It moved west-northwestward and hit Mindanao Island early on 13 February. SANBA weakened to TD intensity over the Mindanao Sea at 06 UTC on the same day. It moved southwestward and turned northwestward. SANBA dissipated over the South China Sea at 12 UTC on 16 February.

### **TY JELAWAT (1803)**

JELAWAT formed as a tropical depression (TD) around the Caroline Islands at 18 UTC on 24 March 2018 and moved west-northwestward. It was upgraded to tropical storm (TS) intensity over the same waters 12 hours later and turned northward gradually. Decelerating northward, JELAWAT was upgraded to typhoon (TY) intensity around the sea east of the Philippines at 00 UTC on 29 March. After turning east-northeastward sharply, it reached its peak intensity with maximum sustained winds of 105 kt and a central pressure of 915 hPa southeast of Okinotorishima Island at 06 UTC on 30 March. JELAWAT was rapidly downgraded to TS intensity around sea west of the Northern Mariana Islands at 18 UTC on 31 March. It weakened to TD intensity over the same waters at 00 UTC on 1 April and dissipated there 12 hours later.

### **TS EWINIAR (1804)**

EWINIAR formed as a tropical depression (TD) off the east coast of Viet Nam at 18 UTC on 2 June 2018 and moved northward. EWINIAR was upgraded to tropical storm (TS) intensity around Hainan Island at 00 UTC on 5 June. After turning in a counterclockwise direction to circle north of Hainan Island, EWINIAR reached its peak intensity with maximum sustained winds of 40 kt and a central pressure of 998 hPa over the same waters at 06 UTC on 7 June. It moved north-northeastward and hit southern China with TS intensity late on 7 June. After weakening to TD intensity in China at 18UTC on 8 June, EWINIAR turned eastward sharply and dissipated around Miyakojima Island at 12 UTC on 11 June.



### **STS MALIKSI (1805)**

MALIKSI formed as a tropical depression (TD) over the sea east of the Philippines at 18 UTC on 3 June 2018 and moved northward and then northwestward. MALIKSI was upgraded to tropical storm (TS) intensity at 18 UTC on 7 June over the same waters and then turned northeastward gradually. It was upgraded to severe tropical storm (STS) intensity south of Okinawa Island at 06 UTC on 9 June and reached its peak intensity with maximum sustained winds of 60 kt and a central pressure of 970 hPa southeast of Okinawa Island at 00 UTC the next day. Keeping the northeastward track, MARIKSI gradually weakened and then transformed into an extratropical cyclone east of Honshu Island at 18 UTC on 11 June. It turned eastward and dissipated around far off east of Japan at 00UTC on 13 June.

### **TS GAEMI (1806)**

GAEMI formed as a tropical depression (TD) over the South China Sea at 12 UTC on 13 June 2018 and moved eastward. It was upgraded to tropical storm (TS) intensity around the Taiwan Strait at 00 UTC on 15 June and hit Taiwan Island immediately thereafter. GAEMI moved east-northeastward and reached its peak intensity with maximum sustained winds of 45 kt and a central pressure of 990 hPa near Okinawa Island at 06 UTC on 16 June. Keeping the east-northeastward track, GAEMI transformed into an extratropical cyclone south of Kyushu Island at 00 UTC on 17 June. After turning northeastward gradually, it dissipated around far off east of Japan at 18UTC on 21 June.

### **TY PRAPIROON (1807)**

PRAPIROON formed as a tropical depression (TD) over the sea east of the Philippines at 00 UTC on 28 June 2018 and moved westward. It was upgraded to tropical storm (TS) intensity around the sea south-southeast of Okinawa Island at 00 UTC on 29 June and then turned northwestward. Gradually turning northeastward, PRAPIROON was upgraded to typhoon (TY) intensity around Okinawa Island at 00 UTC on 2 July and reached its peak intensity with maximum sustained winds of 65 kt and a central pressure of 960 hPa 18 hours later. Keeping its northeastward track, PRAPIROON gradually weakened and then transformed into an extratropical cyclone over the Sea of Japan at 06 UTC on 4 July. It dissipated around northern Japan at 12 UTC on the next day.

### **TY MARIA (1808)**

MARIA formed as a tropical depression (TD) over the sea around the Mariana Islands at 00 UTC on 3 July 2018. Moving northwestward, it was upgraded to tropical storm (TS) intensity at 12 UTC on 4 July and was upgraded to typhoon (TY) intensity at 12 UTC on 5 July day over the same waters. It reached its peak intensity with maximum sustained winds of 105 kt and a central pressure of 915 hPa over the sea northeast of the Philippines at 00 UTC on 9 July. MARIA hit the coast of southern China with TY intensity shortly after 00 UTC on 11 July and was downgraded to TS intensity at 12 UTC the same day. It weakened to TD intensity in central China at 18 UTC on 11 July and dissipated there at 00 UTC on 13 July.

### **TS SON-TINH (1809)**

SON-TINH formed as a tropical depression (TD) around the sea east of the Philippines at 00 UTC on 16 July 2018. After moving westward, it was upgraded to tropical storm (TS) intensity around the Luzon Strait 24 hours later. After reaching its peak intensity with maximum sustained winds of 40 kt and a central pressure of 994 hPa east of Hainan Island at 12 UTC on 17 July, SON-TINH crossed Hainan Island and the Gulf of Tonkin, and then made landfall over the northern part of Viet Nam all with TS intensity. With keeping westward track, it weakened to TD intensity in Viet Nam at 00 UTC on 19 July. After turning sharply to the east in Laos and crossing Hainan Island, SON-TINH turned northwestward and dissipated in the southern part of China at 00 UTC on 25 July.

### **STS AMPIL (1810)**

AMPIL formed as a tropical depression (TD) around the sea east of the Philippines at 12 UTC on 17 July 2018 and moved east-northeastward. It was upgraded to tropical storm (TS) intensity over the same waters 24 hours later. After turning northwestward gradually, it was upgraded to severe tropical storm (STS) intensity and reached its peak intensity with maximum sustained winds of 50 kt and a central pressure of 985 hPa around the sea southeast of Okinawa Island at 18 UTC on 19 July. Keeping its STS intensity and northwestward track, AMPIL passed over Okinawa Island after 23 UTC on 20 July. After moving northwestward over the East China Sea, it was downgraded to TS intensity over the same waters at 00 UTC on 22 July and crossed the coast line of central China. AMPIL weakened to TD intensity around lower Yellow River at 12 UTC on 23 July. After turning northeastward gradually, and holding its TD intensity 36 hours, AMPIL transformed into an extratropical cyclone around Northeast China and then dissipated around the Russian Primorsky Krai at 12 UTC on 26 July.

### **STS WUKONG (1811)**

WUKONG formed as a tropical depression (TD) around Minamitorishima Island at 00 UTC on 22 July 2018 and moved north-northwestward. It was upgraded to tropical storm (TS) intensity over the same waters at 12 UTC on 23 July. It was upgraded to severe tropical storm (STS) intensity and reached its peak intensity with maximum sustained winds of 50 kt and a central pressure of 990 hPa far off east of Japan at 00 UTC on 25 July. Turning northwestward, WUKONG gradually weakened and then transformed into an extratropical cyclone around the Chishima Islands at 00 UTC on 27 July. It dissipated over the same waters 18 hours later.

### **TY JONGDARI (1812)**

JONGDARI formed as a tropical depression (TD) around east of the Philippines at 18 UTC on 23 July 2018 and moved northward. It was upgraded to tropical storm (TS) intensity over the same waters at 12 UTC on 24 July. After gradually turning northeastward, it was upgraded to typhoon (TY) intensity south of the Ogasawara Islands at 18 UTC on 26 July. JONGDARI reached its peak intensity with maximum sustained winds of 75 kt and a central pressure of 960 hPa over the same waters six hours

later. After gradually turning in a counterclockwise direction, it made landfall on Ise City, Mie Prefecture with TY intensity around 16 UTC on 28 July. JONGDARI moved westward in the western Japan and made landfall again on Buzen City, Fukuoka Prefecture with TS intensity before 09 UTC on 29 July. After gradually turning southward and passing around the Shimabara Peninsula with TS intensity around 14 UTC on 29 July, it entered the East China Sea. JONGDARI turned in a counterclockwise direction to circle near Yakushima Island with temporary TD intensity period. After taking a counterclockwise track over the East China Sea, JONGDARI moved westward and hit central China. It weakened to TD intensity at 00 UTC on 3 August and dissipated in central China at 18 UTC on the next day.

#### **TY SHANSHAN (1813)**

SHANSHAN formed as a tropical depression (TD) over the sea southwest of Minamitorishima Island at 06 UTC on 2 August 2018 and move north-northwestward. It was upgraded to tropical storm (TS) intensity around sea east of the Mariana Islands at 00 UTC on 3 August and was upgraded to typhoon (TY) intensity over the same waters at 06 UTC on the next day. SHANSHAN reached its peak intensity with maximum sustained winds of 70 kt and a central pressure of 970 hPa around Minamitorishima Island at 18 UTC on 4 August. It gradually turned northward around sea east of Japan during 8 August and weakened to severe tropical cyclone (STS) intensity off the east coast of Ibaraki Prefecture at 00UTC on 9 August. After accelerating northeastward, SHANSHAN transformed into an extratropical cyclone at 06UTC on 10 August. It dissipated at 12 UTC on the next day.

#### **TS YAGI (1814)**

YAGI formed as a tropical depression (TD) around the sea east of the Philippines at 00 UTC on 6 August 2018 and moved westward. It was upgraded to tropical storm (TS) intensity over the same waters at 00 UTC on 8 August and sharply turned northeastward. After turning northwestward and then turned westward, YAGI reached its peak intensity with maximum sustained winds of 40 kt and a central pressure of 990 hPa east of Miyakojima Island at 12 UTC on 11 August. Keeping northwestward track, it hit the coast of central China with TS intensity after 12 UTC on 12 August and weakened to TD intensity in central China at 00 UTC on 13 August. YAGI turned northward and then transformed into an extratropical cyclone over the Bohai Sea on 06 UTC on 15 August. It dissipated in northern China 24 hours later.

#### **STS LEEPI (1815)**

LEEPI formed as a tropical depression (TD) over the sea west of the Mariana Islands at 12 UTC on 10 August 2018 and moved northwestward. It was upgraded to tropical storm (TS) intensity over the same waters at 12 UTC on 11 August. Keeping its northwestward track, LEEPI was upgraded to severe tropical storm (STS) intensity and reached its peak intensity with maximum sustained winds of 50 kt and a central pressure of 994 hPa over the sea west of the Ogasawara Islands at 06 UTC on 13 August. It made landfall on Hyuga City, Miyazaki Prefecture with TS intensity around 1730 UTC on 14 August.

LEEPI weakened to TD intensity around the Tsushima Strait at 00 UTC on 15 August. After turning northward gradually, it dissipated over the Sea of Japan at 18 UTC on the same day.

#### **TS BEBINCA (1816)**

BEBINCA formed as a tropical depression (TD) over the South China Sea east of Hainan Island at 18 UTC on 9 August 2018. It drifted north toward southern China, turned southward and began to move eastward before it was upgraded to tropical storm (TS) intensity over the same waters at 00 UTC on 13 August. Subsequently it again changed direction and started to move westward. BEBINCA reached its peak intensity with maximum sustained winds of 45 kt and a central pressure of 985 hPa over the sea west of Hainan Island at 06 UTC on 16 August. It crossed the coastline of Viet Nam with TS intensity late on 16 August and weakened to TD intensity in northern Laos at 06 UTC on 17 August. BEBINCA dissipated there at 00 UTC on 18 August.

#### **TS HECTOR (1817)**

HECTOR crossed longitude 180 degrees east with tropical storm (TS) intensity over the sea northeast of Wake Island after 12 UTC on 13 August 2018 and entered the western North Pacific. Moving west-northwestward, it kept its maximum sustained winds of 40 kt and a central pressure of 998 hPa until 00 UTC on 14 August. HECTOR weakened to tropical depression (TD) intensity over the sea north of Wake Island at 12 UTC on 15 August. After gradually turning northward, it dissipated over the sea far east of Japan at 00 UTC on 17 August.

#### **TS RUMBIA (1818)**

RUMBIA formed as a tropical depression (TD) south of Okinawa Island at 00 UTC on 14 August 2018, and moved north-northwestward. Entering the East China Sea, it was upgraded to tropical storm (TS) intensity northwest of Okinawa Island at 06 UTC the next day. After turning west-northwestward, RUMBIA reached its peak intensity with maximum sustained winds of 45 kt and a central pressure of 985 hPa over the East China Sea at 12 UTC on 16 August. With keeping west-northwestward track, it made landfall on central China late on 16 August, and weakened to TD intensity there at 00 UTC on 18 August. After turning east-northeastward gradually, RUMBIA dissipated around the lower reaches of the Yellow River at 18 UTC on 19 August.

#### **TY SOULIK (1819)**

SOULIK formed as a tropical depression (TD) south of Guam Island at 06 UTC on 15 August 2018, and moved north-northwestward. It was upgraded to tropical storm (TS) intensity northwest of Guam Island at 00 UTC the next day. With keeping north-northwestward track, SOULIK was upgraded to typhoon (TY) intensity southwest of Iwoto Island at 12 UTC on 17 August. After turning west-northwestward sharply, SOULIK reached its peak intensity with maximum sustained winds of 85 kt and a central pressure of 950 hPa northeast of Minamidaitojima Island at 18 UTC on 20 August. After entering the East China Sea, SOULIK gradually weakened and turned northeastward west of Jeju

Island. It hit the Korean Peninsula with TS intensity late on 23 August, and entered the Sea of Japan. With keeping its northeastward track, SOULIK transformed into an extratropical cyclone over the same waters 18 UTC on 24 August. After turning eastward and then turning northward, It crossed longitude 180 degrees east over the Bering Sea before 06 UTC on 30 August.

#### **TY CIMARON (1820)**

CIMARON formed as a tropical depression (TD) over the sea around the Marshall Islands at 12 UTC on 16 August 2018 and moved west-northwestward. It was upgraded to tropical storm (TS) intensity over the sea north of the Chuuk Islands at 12 UTC on 18 August. Gradually turning northwestward, CIMARON was upgraded to typhoon (TY) intensity south of the Ogasawara Islands at 00 UTC on 21 August and reached its peak intensity with maximum sustained winds of 85 kt and a central pressure of 950 hPa over the sea west of the Ogasawara Islands at 06 UTC on the next day. After turning northward, CIMARON made landfall on southern Tokushima Prefecture with TY intensity around 12 UTC on 23 August and made landfall again on Himeji City, Hyogo Prefecture with TY intensity around 1430 UTC the same day respectively. Turning north-northeastward, CIMARON weakened and transformed into an extratropical cyclone over the Sea of Japan at 12 UTC on 24 August. It dissipated over the same waters 6 hours later.

#### **TY JEBI (1821)**

JEBI formed as a tropical depression (TD) around the Marshall Islands at 18 UTC on 26 August 2018 and moved northwestward. It was upgraded to tropical storm (TS) intensity over the same waters 24 hours later and gradually turned westward. Keeping its westward track, JEBI developed rapidly and was upgraded to typhoon (TY) intensity around the sea east of the Mariana Islands at 06 UTC on 29 August. JEBI reached its peak intensity with maximum sustained winds of 105 kt and a central pressure of 915 hPa west of the Mariana Islands at 00 UTC on 31 August. After turning northwestward and maintaining its peak intensity for 30 hours, it gradually weakened and turned north-northeastward. Holding very strong TY intensity, JEBI made landfall on the southern part of Tokushima Prefecture before 03 UTC on 4 September and made landfall again around Kobe City, Hyogo Prefecture before 05 UTC on the same day respectively. After crossing Honshu Island, it was downgraded to severe tropical storm (STS) intensity over the Sea of Japan at 15 UTC on the same day. JEBI turned north-northwestward and transformed into an extra tropical cyclone off the coast of the Russian Primorsky Krai at 00 UTC on 5 September. After crossing the coast line of Russia at early on 5 September, it moved northward meandering and crossed latitude 60 degrees north at 06 UTC on 7 September.

#### **TY MANGKHUT (1822)**

MANGKHUT formed as a tropical depression (TD) around the Marshall Islands at 12 UTC on 6 September 2018 and moved westward. It was upgraded to tropical storm (TS) intensity over the same waters at 12 UTC on 7 September. Keeping its westward track, MANGKHUT was upgraded to typhoon

(TY) intensity around sea east of the Mariana Islands at 00 UTC on 9 September. MANGKHUT reached its peak intensity with maximum sustained winds of 110 kt and a central pressure of 905 hPa around sea west of the Mariana Islands at 12 UTC on 11 September and then it gradually turned west-northwestward. MANGKHUT hit the Philippines with TY intensity after 12UTC on 14 September and hit the southern coast of China with TY intensity before 12UTC on 16 September. MANGKHUT rapidly weakened to TD intensity in southern part China at 06UTC on the next day and dissipated there 18 hours later.

#### **TS BARIJAT (1823)**

BARIJAT formed as a tropical depression (TD) around the Luzon Strait at 06 UTC on 8 September 2018 and moved northeastward. After turning westward sharply, it was upgraded to tropical storm (TS) intensity over the South China Sea at 00 UTC on 11 September and reached its peak intensity with maximum sustained winds of 40 kt and a central pressure of 998 hPa 6 hours later. Keeping westward track, BARIJAT hit the coast of southern China with TS intensity after 18 UTC on 12 September. It weakened to TD intensity in southern China at 06 UTC on 13 September and dissipated there 6 hours later.

#### **TY TRAMI (1824)**

TRAMI formed as a tropical depression (TD) over the sea near the Mariana Islands at 06 UTC on 20 September 2018 and moved northwestward. It was upgraded to tropical storm (TS) intensity over the same waters at 06 UTC on the next day. After moving west-northwestward, TRAMI was upgraded to typhoon (TY) intensity south of Okinotorishima Island at 18 UTC on 22 September. After reaching its peak intensity with maximum sustained winds of 105 kt and a central pressure of 915 hPa over the sea east of the Philippines at 18 UTC on 24 September, TRAMI decelerated northward over the sea south of the Okinawa Islands and then gradually accelerated northeastward. It made landfall on Tanabe City, Wakayama Prefecture with TY intensity around 11 UTC on 30 September. TRAMI transformed into an extratropical cyclone over the sea east of Japan at 00 UTC on 1 October. It crossed longitude 180 degrees east over the Bering Sea before 18 UTC on 3 October.

#### **TY KONG-REY (1825)**

KONG-REY formed as a tropical depression (TD) over the sea to the west of the Chuuk Lagoon at 00 UTC on 28 September 2018. It moved northwestward and was upgraded to tropical storm (TS) intensity over the sea to the southwest of the island of Guam at 06 UTC on 29 September. KONG-REY was upgraded to typhoon (TY) intensity east of the Philippines at 06 UTC on 30 September and reached its peak intensity with maximum sustained winds of 115 kt and a central pressure of 900 hPa over the sea far east of the Philippines at 12 UTC on 1 October. It continued to head northwestward and passed through the channel between Okinawa Island and Miyakojima Island. KONG-REY turned northward and northeastward subsequently over the East China Sea, crossed the Korean Peninsula with severe tropical storm (STS) intensity early on 6 October and entered the Sea of Japan. It transformed into an

extratropical cyclone at 12 UTC on 6 October over the same waters, moved east and dissipated over the Pacific far east of northern Japan at 18 UTC on 7 October.

#### **TY YUTU (1826)**

YUTU formed as a tropical depression (TD) over the sea around the Marshall Islands at 18 UTC on 20 October and was upgraded to tropical cyclone (TS) intensity over the same waters at 00 UTC on 22 October. Moving west-northwestward, it was upgraded to typhoon (TY) intensity over the sea around the Chuuk Islands at 00 UTC on 23 October. It reached its peak intensity with maximum sustained winds of 115 kt and a central pressure of 900 hPa over the sea around the Mariana Islands at 12 UTC on 24 October. Moving westward, YUTU crossed Luzon Island with TY intensity from the late hours of 29 October to the next day. Turning northwestward, it was downgraded to TS intensity in the South China Sea at 06 UTC on 31 October. After remaining almost stationary over the same waters, it weakened to TD intensity at 06 UTC on 2 November and dissipated there 24 hours later.

#### **TS TORAJI (1827)**

TORAJI formed as a tropical depression (TD) over the South China Sea at 18 UTC on 16 November 2018, and moved northwestward. With turning west-northwestward gradually, it was upgraded to tropical storm (TS) intensity, and reached its peak intensity with maximum sustained winds of 35 kt and a central pressure of 1004 hPa over the same waters at 06 UTC the next day. Keeping its west-northwestward track, TORAJI weakened to TD intensity offshore of the southern part of Viet Nam at 00 UTC on 18 November. After crossing the coast of Viet Nam, it dissipated in the country at 18 UTC the same day.

#### **TY MAN-YI (1828)**

MAN-YI formed as a tropical depression (TD) around the Chuuk Islands at 12 UTC on 20 November 2018 and moved northwestward. It was upgraded to tropical storm (TS) intensity over the same waters six hours later. Gradually accelerating west-northwestward, MAN-YI was upgraded to typhoon (TY) intensity around the sea west of the Mariana Islands at 12 UTC on 22 November. After decelerating northward, MAN-YI remained almost stationary and reached its peak intensity with maximum sustained winds of 80 kt and a central pressure of 960 hPa around Okinotorishima Island at 12 UTC on 24 November. After maintaining its peak intensity for 12 hours over the same waters, it started to move northwestward and weakened rapidly. MAN-YI was downgraded to TD intensity around the sea south of Minamidaitojima Island at 12 UTC on 26 November, and then moving northward. It was upgraded to TS intensity again at 00 UTC on 27 November and re-downgraded to TD intensity six hours later over the same waters. Accelerating northeastward, MAN-YI transformed into an extratropical cyclone around the sea west of Chichijima Island at 06 UTC on 28 November. Keeping its northeastward track, it crossed longitude 180 degrees east at 12 UTC on 30 November.

#### **STS USAGI (1829)**

USAGI formed as a tropical depression (TD) over the sea around the Marshall Islands at 00 UTC on 13

November 2018 and moved westward. After hitting the Philippines with TD intensity, it was upgraded to tropical storm (TS) intensity over the South China Sea at 00 UTC on 22 November. USAGI was upgraded to severe tropical storm (STS) intensity over the same waters at 06 UTC on 23 November and reached its peak intensity with maximum sustained winds of 60 kt and a central pressure of 990 hPa over the sea east of Viet Nam at 00 UTC on the next day. After crossing the coast of Viet Nam, USAGI weakened to TD intensity at 00 UTC on 26 November and dissipated around Cambodia 24 hours later.