

**ESCAP/WMO Typhoon Committee**  
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Yokohama  
Japan

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30 January 2017  
ENGLISH ONLY

## **REVIEW OF THE 2016 TYPHOON SEASON**

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

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### **Action Proposed**

The Committee is invited to review the 2016 typhoon season.

### **APPENDIXES:**

- A) DRAFT TEXT FOR INCLUSION IN SESSION REPORT
- B) Review of the 2016 Typhoon Season

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

**x.x. Summary of typhoon season in TC region**

1. The Committee took note with appreciation of the review of the 2016 typhoon season provided by the RSMC Tokyo as provided in Appendix XX.
2. The Committee noted that in the western North Pacific and the South China Sea, 26 named tropical cyclones (TCs) formed in 2016, which is near the 30-year average of 25.6 for the period, 1981-2010. 13 out of them reached typhoon (TY) intensity.
3. No named TCs formed from January to June. The first named TC in 2016 was formed on 3 July, which is the second latest formation of the annual first named TC since 1951 when the statistical record on TC in RSMC Tokyo-Typhoon Center started. This late formation is the typical characteristics seen in the post-El Nino years like 1998, 1973, and 1983.
4. The mean genesis point of named TCs formed in summer (June to August) was 20.8°N and 138.6°E, showing a northeastward deviation from the 30-year summer average (18.4°N and 135.9°E) and that of named TCs formed in autumn (September to November) was 16.5°N and 134.5°E, showing a westward deviation from the 30-year autumn average (15.9°N and 137.8°E). The autumn deviation is thought to be attributable to the shift of convective activity due to the La Nina event.
5. The mean period of TCs sustaining TS intensity or higher was 4.2 days, shorter than the 30-year average (5.3 days).
6. Four named TCs formed in July (see red lines in Figure 3). Nepartak (1601) formed over the sea around the Caroline Islands and caused severe damage to China. Mirinae (1603) formed east of Hainan Island and damaged China and Viet Nam. Nida (1604) formed east of the Philippines and damaged China.
7. Seven named TCs formed in August (see orange lines in Figure 3). Chanthu (1607) formed west of the Northern Mariana Islands and damaged Japan. Dianmu (1608) formed over the South China Sea and damaged China and Viet Nam. Mindulle (1609) formed west of the Northern Mariana Islands. Lionrock (1610) formed south of Shikoku Island. Kompasu (1611) formed east of Japan. Chanthu (1607) and these three TCs made landfall in Japan one after another and caused severe damage to the country in late August.
8. Seven named TCs formed in September (see green lines in Figure 3). Namtheun (1612) formed south of Okinawa Island and damaged Japan. Meranti (1614) formed west of the Northern Mariana Islands and caused severe damage to the Philippines and China. Rai (1615) formed off the coast of Viet Nam and damaged Thailand. Malakas (1616) formed west of the Northern Mariana Islands and damaged China and Japan. Megi (1617) formed west of the Northern Mariana Islands and caused severe damage to China. Chaba (1618) formed west of Guam Island and damaged Japan and Korea.
9. Eight named TCs formed from October to December (see blue lines in Figure 3). Sarika (1621) formed east of the Philippines. Haima (1622) formed around the Caroline Islands. These two TCs damaged the Philippines and China. Nock-Ten (1626) formed southeast of the Yap Islands and caused severe damage to the Philippines.

## **APPENDIX B:**

### **Review of the 2016 Typhoon Season**

In the western North Pacific and the South China Sea, 26 named tropical cyclones (TCs) formed in 2016, which was normal, and 13 out of them reached typhoon (TY) intensity (see Table 1).

The most notable feature of the season is that no named TCs formed from January to June. The first named TC in 2016 was formed on 3 July, which is the second latest formation of the annual first named TC since 1951 when the statistical record on TC in RSMC Tokyo-Typhoon Center started. This late formation is the typical characteristics seen in the post-El Nino years like 1998, 1973, and 1983. The mean genesis point of named TCs formed in summer (June to August) was 20.8°N and 138.6°E, showing a northeastward deviation from the 30-year summer average\* (18.4°N and 135.9°E) and that of named TCs formed in autumn (September to November) was 16.5°N and 134.5°E, showing a westward deviation from the 30-year autumn average\* (15.9°N and 137.8°E). The autumn deviation is thought to be attributable to the shift of convective activity due to the La Nina event. The mean period of TCs sustaining TS intensity or higher was 4.2 days, shorter than the 30-year average\* (5.3 days).

Four named TCs formed in July (see red lines in Figure 3). Nepartak (1601) formed over the sea around the Caroline Islands and caused severe damage to China. Mirinae (1603) formed east of Hainan Island and damaged China and Viet Nam. Nida (1604) formed east of the Philippines and damaged China.

Seven named TCs formed in August (see orange lines in Figure 3). Chanthu (1607) formed west of the Northern Mariana Islands and damaged Japan. Dianmu (1608) formed over the South China Sea and damaged China and Viet Nam. Mindulle (1609) formed west of the Northern Mariana Islands. Lionrock (1610) formed south of Shikoku Island. Kompasu (1611) formed east of Japan. Chanthu (1607) and these three TCs made landfall in Japan one after another and caused severe damage to the country in late August.

Seven named TCs formed in September (see green lines in Figure 3). Namtheun (1612) formed south of Okinawa Island and damaged Japan. Meranti (1614) formed west of the Northern Mariana Islands and caused severe damage to the Philippines and China. Rai (1615) formed off the coast of Viet Nam and damaged Thailand. Malakas (1616) formed west of the Northern Mariana Islands and damaged China and Japan. Megi (1617) formed west of the Northern Mariana Islands and caused severe damage to China. Chaba (1618) formed west of Guam Island and damaged Japan and Korea.

Eight named TCs formed from October to December (see blue lines in Figure 3). Sarika (1621) formed east of the Philippines. Haima (1622) formed around the Caroline Islands. These two TCs damaged the Philippines and China. Nock-Ten (1626) formed southeast of the Yap Islands and caused severe damage to the Philippines.

\* The 30-year averaging period is from 1981 to 2010

Table 1 List of the tropical cyclones reaching TS intensity or higher in 2016

Tropical Cyclone	Duration (UTC)				Minimum Central Pressure			Max Wind (kt)		
	(TS or higher)				(UTC)	lat(N)	long(E)		(hPa)	
TY Nepartak (1601)	030000	Jul	-	090600	Jul	060600	19.5	128.4	900	110
TS Lupit (1602)	231800	Jul	-	241800	Jul	231800	28.9	157.1	1000	40
STS Mirinae (1603)	260600	Jul	-	280600	Jul	271200	19.9	106.7	980	55
STS Nida (1604)	300600	Jul	-	021200	Aug	310600	18.2	122.3	975	60
STS Omais (1605)	040000	Aug	-	091800	Aug	060600	24.9	147.7	975	60
TS Conson (1606)	090000	Aug	-	150000	Aug	130600	31.6	154.3	985	45
STS Chanthu (1607)	131800	Aug	-	171800	Aug	160000	31.6	142.5	980	55
TS Dianmu (1608)	171800	Aug	-	191200	Aug	181800	20.5	108.2	980	40
TY Mindulle (1609)	190600	Aug	-	230300	Aug	211800	33.1	139.4	975	65
TY Lionrock (1610)	211200	Aug	-	301500	Aug	280600	27.7	137.9	940	90
TS Kompasu (1611)	200000	Aug	-	211800	Aug	200000	32.9	147.3	994	35
TY Namtheun (1612)	010000	Sep	-	041800	Sep	021800	28.5	130.6	955	70
TS Malou (1613)	060600	Sep	-	070000	Sep	060600	27.6	126.8	1000	40
TY Meranti (1614)	100600	Sep	-	151200	Sep	131200	20.4	122.9	890	120
TS Rai (1615)	121800	Sep	-	130600	Sep	121800	15.5	108.9	996	35
TY Malakas (1616)	121800	Sep	-	201200	Sep	161800	23.0	123.1	930	95
TY Megi (1617)	231800	Sep	-	281200	Sep	270000	23.3	123.3	945	85
TY Chaba (1618)	290600	Sep	-	051200	Oct	030900	25.4	126.9	905	115
STS Aere (1619)	051800	Oct	-	100000	Oct	071800	21.2	115.9	975	60
TY Songda (1620)	081200	Oct	-	130600	Oct	111800	30.3	148.9	925	100
TY Sarika (1621)	131800	Oct	-	190600	Oct	151800	15.8	121.8	935	95
TY Haima (1622)	150000	Oct	-	211800	Oct	181800	16.0	127.5	900	115
TY Meari (1623)	030000	Nov	-	070600	Nov	051200	18.3	140.7	960	75
TS Ma-on (1624)	100000	Nov	-	120000	Nov	100000	16.9	156.9	1002	35
STS Tokage (1625)	251200	Nov	-	280000	Nov	260000	13.2	118.7	992	50
TY Nock-ten (1626)	211800	Dec	-	271800	Dec	240600	13.3	128.2	915	105

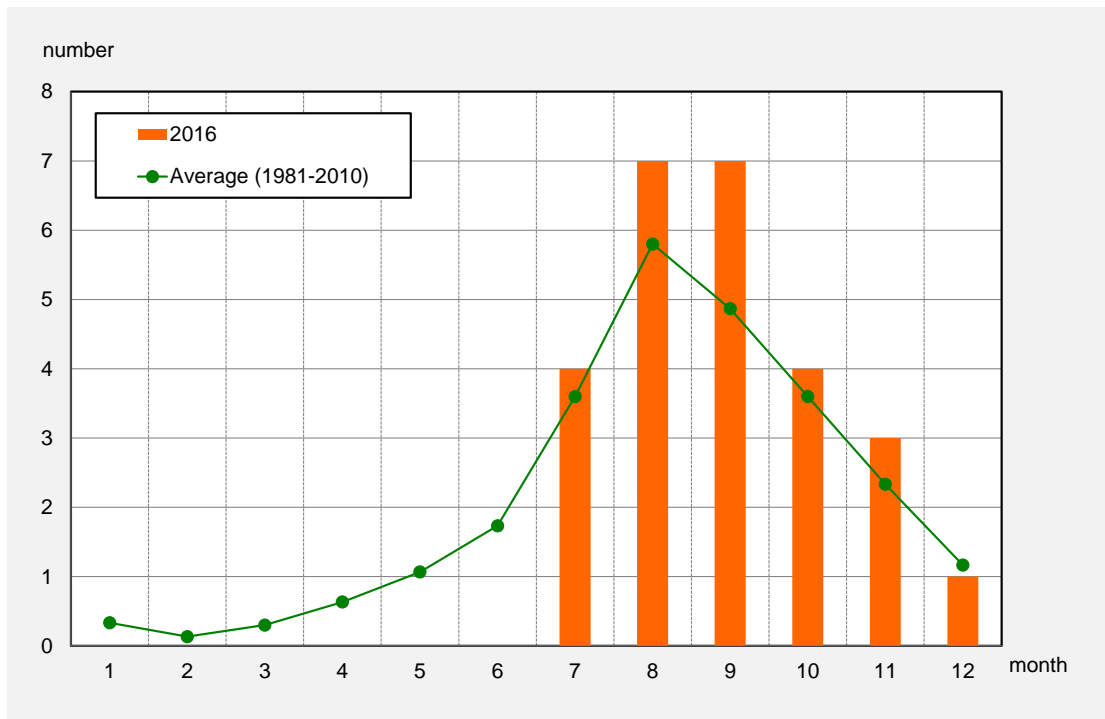


Figure 1 Monthly formation number of named TCs in 2016

Orange bar: formation number in 2016, green line: 30-year average from 1981 to 2010

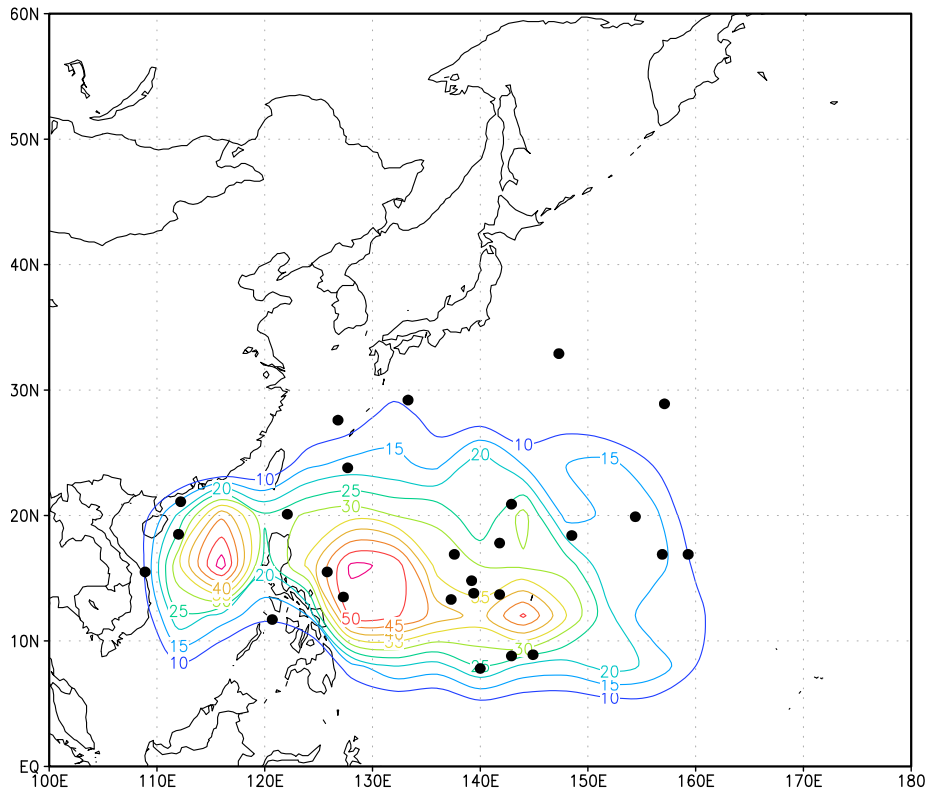


Figure 2 Genesis points of Tropical Cyclones in 2016 (dots) and frequency distribution of genesis points for 1951-2015 (lines)

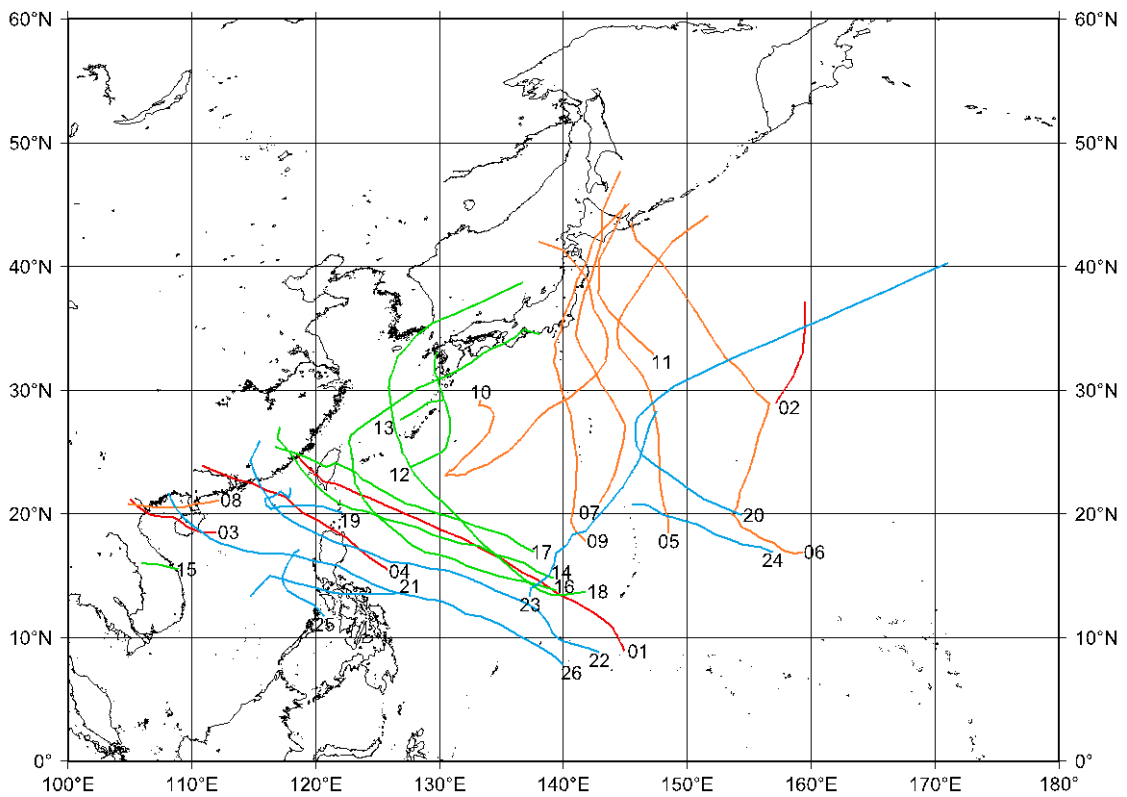


Figure 3 Tracks of Tropical Cyclones in 2016

The numbers represent the genesis points of named TCs (the last two digits of their identification numbers).

## **Narrative Accounts of the 26 Named Tropical Cyclones in 2016**

### **TY NEPARTAK (1601)**

NEPARTAK formed as a tropical depression (TD) around the Caroline Islands at 12 UTC on 02 July 2016. After moving northwestward, it was upgraded to tropical storm (TS) intensity over the same waters 12 hours later. Keeping its northwestward track, NEPARTAK was upgraded to typhoon (TY) intensity over the sea east of the Philippines at 00 UTC on 05 July and reached its peak intensity with maximum sustained winds of 110 kt and a central pressure of 900 hPa south of Okinawa Island at 06 UTC on the next day. Keeping its northwestward track, NEPARTAK hit Taiwan Island with weakening its intensity rapidly. After it entered the Taiwan Strait, NEPARTAK hit southeast coast of China with TS intensity after 00 UTC on 09 July. Moving northwestward, NEPARTAK weakened to TD intensity in southern part of China 6 hours later. NEPARTAK dissipated there at 06 UTC on 10 July.

### **TS LUPIT (1602)**

LUPIT formed as a tropical depression (TD) around Minamitorishima at 18 UTC on 22 July 2016 and moved northeastward. After upgrading to tropical storm (TS) intensity northeast of the same island at 18 UTC on 23 July and gradually turning northward, LUPIT reached its peak intensity with maximum sustained winds of 40 kt and a central pressure of 1000 hPa around far off east of Japan at 00 UTC on the next day. LUPIT transformed into an extratropical cyclone there at 18 UTC on 24 July. It gradually turned north-northwestward and dissipated around the Kuril Islands at 12 UTC on 26 July.

### **STS MIRINAE (1603)**

MIRINAE formed as a tropical depression (TD) over the South China Sea at 12 UTC on 25 July 2016. After moving west-northwestward, it was upgraded to tropical storm (TS) intensity over the sea east of Hainan Island at 06 UTC on the next day. Keeping its west-northwestward track, MIRINAE crossed Hainan Island with TS intensity. It was upgraded to severe tropical storm (STS) intensity and reached its peak intensity with maximum sustained winds of 55 kt and a central pressure of 980 hPa in the Gulf of Tonkin at 12 UTC on 27 July. After crossing the coast line of Viet Nam, MIRINAE weakened to TD intensity in northern part of the county on 06 UTC on 28 July and dissipated there 12 hours later.

### **STS NIDA (1604)**

NIDA formed as a tropical depression (TD) east of the Philippines at 12 UTC on 29 July 2016 and moved northward. After gradually turning northwestward, it upgraded to tropical storm (TS) intensity over the same waters at 06 UTC the next day. After turned west-northwestward, NIDA upgraded to severe tropical storm (STS) intensity around Luzon Island at 00 UTC on 31 July and reached its peak intensity with maximum sustained winds of 60 kt and a central pressure of 975 hPa 6 hours later. After hitting the southern part of China with TS intensity early on 02 August, it weakened to TD intensity in the same area 12 UTC on the same day. NIDA dissipated in the southern part of China at 06 UTC on 03 August.

### **STS OMAIS (1605)**

OM AIS formed as a tropical depression (TD) around the sea east of the Northern Mariana Islands at 12 UTC on 2 August 2016. After moving northward, it upgraded to tropical storm (TS) intensity over the same waters at 00 UTC on 4 August. Keeping its northward track, OMAIS reached its peak intensity with maximum sustained winds of 60 kt and a central pressure of 975 hPa around the Ogasawara Islands at 06 UTC on 6 August. Turning north-eastward, OMAIS transformed into an extratropical cyclone far east of Hokkaido at 18 UTC on 9 August. It crossed longitude 180 degrees east over the Bering Sea before 06 UTC on 12 August.

### **TS CONSON (1606)**

CONSON formed as a tropical depression (TD) around Wake Island at 12 UTC on 7 August 2016 and moved southwestward. It was upgraded to tropical storm (TS) intensity around Minamitorishima Island at 00 UTC on 9 August and moved northwestward. After turning north-northeastward and then moving north-northwestward, CONSON reached its peak intensity with maximum sustained winds of 45 kt and a central pressure of 985 hPa east of Japan at 06 UTC on 13 August. Keeping its north-northwestward track, it crossed the Nemuro Peninsula, Hokkaido Prefecture with TS intensity around 23 UTC 14 August. CONSON transformed into an extratropical cyclone over the Sea of Okhotsk on 00 UTC on 15 August and moved northward. It dissipated over the same waters at 18 UTC on the next day.

### **STS CHANTHU (1607)**

CHANTHU formed as a tropical depression (TD) around the sea west of the Northern Mariana Islands at 00 UTC on 12 August 2016. After moving northeastward, it upgraded to tropical storm (TS) intensity over the same waters at 18 UTC on the next day. Keeping its northward track, CHANTHU was upgraded to severe tropical storm (STS) intensity around the Ogasawara Islands at 18 UTC on 14 August. Turning northwestward and then northward, CHANTHU reached its peak intensity with maximum sustained winds of 55 kt and a central pressure of 980 hPa off the eastern coast of the Tohoku Region at 00 UTC on 17 August. Keeping its northward track, CHANTHU landed on around Cape Erimo, Hokkaido Prefecture around 0830UTC on 17 August. CHANTHU transformed into an extratropical cyclone around the Sakhalin Island at 18 UTC on the same day. It crossed latitude 60 degrees north over the Sea of Okhotsk at 18 UTC on 18 August.

### **TS DIANMU (1608)**

DIANMU formed as a tropical depression (TD) around the Taiwan Strait at 06 UTC on 15 August 2016. After moving westward, it was upgraded to tropical storm (TS) intensity over the South China Sea at 18 UTC on 17 August. Keeping its westward track, DIANMU reached its peak intensity with maximum sustained winds of 40 kt and a central pressure of 980 hPa in the Gulf of Tongking 24 hours later. After hitting the northern part of Viet Nam with TS intensity early on 19 August, it weakened to TD intensity

there at 12 UTC on the same day and dissipated around Myanmar 00 UTC on 20 August.

#### **TY MINDULLE (1609)**

MINDULLE formed as a tropical depression (TD) around the sea west of the Northern Mariana Islands at 00 UTC on 17 August 2016, and moved eastward and then northwestward. It was upgraded to tropical storm (TS) intensity over the same waters at 06 UTC on 19 August and moved northward. MINDULLE was upgraded to typhoon (TY) intensity and reached its peak intensity with maximum sustained winds of 65 kt and a central pressure of 975 hPa around Hachijojima Island at 18 UTC on 21 August. MINDULLE made landfall on Tateyama City, Chiba Prefecture around 0330 UTC 22 August and moved north-northeastward. After travelling over the eastern and northern part of Japan, it landed on again central part of Hidaka District, Hokkaido Prefecture before 21 UTC on that day. MINDULLE transformed into an extratropical cyclone over the Sea of Okhotsk at 03 UTC on 23 August and dissipated three hours later.

#### **TY LIONROCK (1610)**

LIONROCK formed as a tropical depression (TD) around the sea east-northeast of Minamitorishima Island at 00 UTC on 17 August 2016 and moved west-northwestward. After turning and decelerating southwestward, it was upgraded to tropical storm (TS) intensity south of Shikoku Island at 12 UTC on 21 August. After LIONROCK sharply turned southeastward and then gradually turned southwestward again, it was upgraded to typhoon (TY) intensity east of Minamidaitojima Island at 18 UTC on 23 August. LIONROCK kept its southwestward track and sharply turned eastward south of Minamidaitojima Island at 18 UTC on 25 August. It accelerated northeastward and reached its peak intensity with maximum sustained winds of 90 kt and a central pressure of 940 hPa west of Chichijima Island at 06 UTC on 28 August. After gradually turning north-northwestward, LIONROCK made landfall on Ofunato City, Iwate Prefecture with TY intensity around 0830 UTC on 30 August and moved northwestward. It transformed into an extratropical cyclone over the Sea of Japan at 15 UTC on 30 August and dissipated there nine hours later.

#### **TS KOMPASU (1611)**

KOMPASU formed as a tropical depression (TD) around Minamitorishima Island at 12 UTC on 18 August 2016 and moved northward. Gradually turning northwestward, 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 994 hPa east of Japan at 00 UTC on 20 August. After turning north-northeastward, KOMPASU made landfall on Kushiro City, Hokkaido Prefecture with TS intensity after 1400 UTC on 21 August. It entered the Sea of Okhotsk and transformed into an extratropical cyclone on 18 UTC on that day. KOMPASU dissipated there at 12 UTC on 22 August.

#### **TY NAMTHEUN (1612)**

NAMTHEUN formed as a tropical depression (TD) around the Luzon Strait at 00 UTC on 31 August 2016.



Moving northeastward, it was upgraded to tropical storm (TS) intensity south of Okinawa Island at 00 UTC on 01 September. After NAMTHEUN turned northward, it reached its peak intensity with maximum sustained winds of 70 kt and a central pressure of 955 hPa east of Amami-Osima Island at 18 UTC on the next day. Keeping its northward track, NAMTHEUN made landfall on around Nagasaki City, Nagasaki Prefecture after 16 UTC on 4 September, and weakened to TD intensity 2 hours later. Turning northeastward, NAMTHEUN dissipated over the Sea of Japan at 18 UTC on the next day.

#### **TS MALOU (1613)**

MALOU formed as a tropical depression (TD) around Miyakojima Island at 12 UTC on 05 September 2016. Moving northeastward, it was upgraded to tropical storm (TS) intensity and reached its peak intensity with maximum sustained winds of 40 kt and a central pressure of 1000 hPa north of Kumejima Island at 06 UTC on 06 September. Gradually turning eastward, MALOU weakened to TD intensity south of Yakushima Island at 00 UTC on 07 September, and it dissipated south of Kyushu Island 12 hours later.

#### **TY MERANTI (1614)**

MERANTI formed as a tropical depression (TD) around the sea west of the Northern Mariana Islands at 12 UTC on 9 September 2016, and moved west-northwestward. It was upgraded to tropical storm (TS) intensity over the same waters at 06 UTC on 10 September and kept its west-northwestward track. MERANTI was upgraded to typhoon (TY) intensity over the same waters at 06 UTC on 11 September, and reached its peak intensity with maximum sustained winds of 120 kt and a central pressure of 890 hPa north of Luzon Island at 12 UTC on 13 September. After gradually turning northwestward, it hit southeast of China with TY intensity late on 14 September. After turning north-northeastward, it weakened to TD intensity in the same area at 12 UTC on 15 September. MERANTI transformed into an extratropical cyclone around the mouth of Yangtze River at 06 UTC on 16 September and dissipated around Jeju Island at 18 UTC on the next day.

#### **TS RAI (1615)**

RAI formed as a tropical depression (TD) over the South China Sea at 06 UTC on 11 September 2016. After moving northwestward, 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 996 hPa off the coast of Viet Nam on 18UTC on 12 September. After turning westward and hitting the central part of Viet Nam with TS intensity late on the same day, RAI weakened to TD intensity in Laos at 06 UTC on 13 September and dissipated in Thailand 18 hours later.

#### **TY MALAKAS (1616)**

MALAKAS formed as a tropical depression (TD) over the waters south of Guam Island at 18 UTC on 11 September 2016. Moving west-northwestward, it was upgraded to tropical storm (TS) intensity west of the Northern Mariana Islands at 18 UTC on the next day. Keeping its west-northwestward track,

MALAKAS was upgraded to typhoon (TY) intensity east of the Philippines at 00 UTC on 14 September. Gradually turning northward, MALAKAS reached its peak intensity with maximum sustained winds of 95 kt and a central pressure of 930 hPa south of Yonagunijima Island at 18 UTC on 16 September. After entering the East China Sea, it turned northeastward and weakened its intensity slightly. MALAKAS developed again and reached its second peak intensity with maximum sustained winds of 95 kt and a central pressure of 940 hPa over the same waters at 18 UTC on 18 September. Keeping its northeastward track, MALAKAS made landfall on the Osumi Peninsula, Kagoshima Prefecture with TY intensity after 15 UTC on 19 September. Weakening its intensity rapidly, MALAKAS made landfall again on around Tanabe City in Wakayama Prefecture with severe tropical storm (STS) intensity around 0430 UTC, and then made landfall again around Tokoname City in Aichi Prefecture with TS intensity after 08 UTC on 20 September. It transformed into an extratropical cyclone off the coast of the Tokai region at 12 UTC on that day and dissipated 6 hours later.

#### **TY MEGI (1617)**

MEGI formed as a tropical depression (TD) over the sea west of the Northern Mariana Islands at 18 UTC on 22 September 2016. After moving northwestward, it was upgraded to tropical storm (TS) intensity over the same waters 24 hours later. Keeping its northwestward track, MEGI was upgraded to typhoon (TY) intensity over the sea east of the Philippines at 18 UTC on 24 September. MEGI reached its peak intensity with maximum sustained winds of 85 kt and a central pressure of 945 hPa southwest of Ishigakijima Island at 00 UTC on 27 September and hit Taiwan Island with weakening its intensity on the same day. After entering the Taiwan Strait, MEGI hit southeast coast of China with TS intensity before 00 UTC on 28 September. Moving northwestward, it weakened to TD intensity in southern part of China 12 hours later. MEGI turned northeastward and dissipated at 12 UTC on 29 September.

#### **TY CHABA (1618)**

CHABA formed as a tropical depression (TD) southwest of Wake Island at 18 UTC on 24 September 2016. After moving westward, it was upgraded to tropical storm (TS) intensity around the sea west of Guam Island at 06 UTC on 29 September. Turning northwestward, CHABA was upgraded to typhoon (TY) intensity around the sea far east of the Philippines at 12 UTC on 01 October, and reached its peak intensity with maximum sustained winds of 115 kt and a central pressure of 905 hPa southwest of Okinawa Island at 09 UTC on 03 October. After gradually turning northeastward, CHABA transformed into an extratropical cyclone around Noto Peninsula at 12 UTC on 05 October. It moved east-northeastward and crossed longitude 180 degrees east over the sea around the Aleutian Islands before 18 UTC on 7 October.

#### **STS AERE (1619)**

AERE formed as a tropical depression (TD) south of Okinawa Island at 12 UTC on 4 October 2016, and moved westward. It was upgraded to tropical storm (TS) intensity south of Taiwan Island at 18 UTC on 5 October and kept its west-northwestward track. AERE was upgraded to severe tropical storm (STS)

intensity over the South China Sea at 06 UTC on 7 October, and reached its peak intensity with maximum sustained winds of 60 kt and a central pressure of 975 hPa over the same waters at 18 UTC on 7 October. Remaining almost stationary, it weakened to TD intensity at 00 UTC on 10 October, and dissipated over the same waters at 06 UTC on 10 October.

#### **TY SONGDA (1620)**

SONGDA crossed longitude 180 degrees east with tropical depression (TD) intensity over the sea northeast of the Marshall Islands after 18 UTC on 3 October 2016 and entered the western North Pacific. After moving west-northwestward, it was upgraded to tropical storm (TS) intensity south of Minamitorishima Island at 12 UTC on 8 October. Turning in a clockwise direction, SONGDA was upgraded typhoon (TY) intensity east of the Ogasawara Islands at 00 UTC on 10 October, and reached its peak intensity with maximum sustained winds of 100 kt and a central pressure of 925 hPa east of the Izu Islands on 18 UTC the next day. Keeping its northeastward track, SONGDA transformed into an extratropical cyclone around sea south of the Aleutian Islands at 06 UTC on 13 October and crossed longitude 180 degrees east after 12 UTC the same day.

#### **TY SARIKA (1621)**

SARIKA formed as a tropical depression (TD) over the sea east of the Philippines at 00 UTC on 13 October 2016. Moving west-northwestward, it was upgraded to tropical storm (TS) intensity over the same waters at 18 UTC on that day. Keeping its west-northwestward track, SARIKA was upgraded to typhoon (TY) intensity around the Philippines at 00 UTC on 15 October. And then SARIKA reached its peak intensity with maximum sustained winds of 95 kt and a central pressure of 935 hPa around Luzon Island at 18 UTC on that day just before hitting Luzon Island. After entering the South China Sea, SARIKA gradually turned northwestward with weakening its intensity and crossed Hainan Island early on 18 October. It was downgraded to TD intensity near the border of China and Viet Nam at 06UTC on the next day and dissipated in the southern China 18 hours later.

#### **TY HAIMA (1622)**

HAIMA formed as a tropical depression (TD) around the Caroline Islands at 12 UTC on 14 October 2016. Moving west-northwestward, it was upgraded to tropical storm (TS) intensity over the same waters 12 hours later. Moving northwestward, HAIMA was upgraded to typhoon (TY) intensity over the same waters at 06 UTC on 16 October and reached its peak intensity with maximum sustained winds of 115 kt and a central pressure of 900 hPa around sea east of the Philippines at 18 UTC on 18 October. After Moving west-northwestward, it hit Luzon Island with TY intensity the next day and entered the South China Sea. Turning northwestward, HAIMA hit the southern part of China and it was downgraded to tropical storm (TS) intensity at 06 UTC on 21 October. HAIMA weakened to TD intensity around southern part of China at 18 UTC on 21 October and transformed into an extratropical cyclone 6 hours later. After gradually turning eastward and entering the East China Sea, it moved to south of Japan and dissipated around sea east of the Ogasawara Islands at 12UTC on 26 October.

### **TY MEARI (1623)**

MEARI formed as a tropical depression (TD) over the sea around the Caroline Islands at 18 UTC on 30 October 2016 and moved west-northwestward. Gradually turning northeastward, it was upgraded to tropical storm (TS) intensity west of the Mariana Islands at 00 UTC on 3 November. It reached its peak intensity with maximum sustained winds of 75 kt and a central pressure of 960 hPa south of the Ogasawara Islands at 12 UTC on 5 November. MEARI accelerated northeastward and transformed into an extratropical cyclone east of the Ogasawara Islands at 06 UTC on 7 November. MEARI kept its northeastward track and dissipated far east of Japan at 00 UTC on 10 November.

### **TS MA-ON (1624)**

MA-ON formed as a tropical depression (TD) around the Marshall Islands at 18 UTC on 8 November 2016 and moved northwestward. 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 1002 hPa around the Mariana Islands at 00 UTC on 10 November, and turned west-northwestward. MA-ON weakened to TD intensity around the Northern Mariana Islands at 00 UTC on 12 November and dissipated around the Ogasawara Islands at 06 UTC the next day.

### **STS TOKAGE (1625)**

TOKAGE formed as a tropical depression (TD) over the sea northeast of Mindanao Island at 00 UTC on 24 November 2016 and moved west-northwestward. After hitting the middle of the Philippines, it was upgraded to tropical storm (TS) intensity south of Mindoro Island at 12 UTC the next day. TOKAGE turned northwestward and reached its peak intensity with maximum sustained winds of 50 kt and a central pressure of 992 hPa west of Mindoro Island at 00 UTC on 26 November. After turning north-northeastward, it weakened to TD intensity west of Luzon Island at 00 UTC on 28 November and dissipated there 6 hours later.

### **TY NOCK-TEN (1626)**

NOCK-TEN formed as a tropical depression (TD) over the sea around the Caroline Islands at 12 UTC on 20 December 2016. Moving northwestward, it was upgraded to tropical storm (TS) intensity over the sea southeast of the Yap Islands at 18 UTC on the next day. Gradually turning westward, it was upgraded to typhoon (TY) intensity over the sea far east of the Philippines at 06 UTC on 23 December. Keeping its westward track, NOCK-TEN developed rapidly and reached 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 06 UTC on 24 December, and then hit Luzon Island with TY intensity late on the next day. Entering the South China Sea and turning southwestward, it was downgraded to TD intensity at 18UTC on 27 December. It dissipated over the same waters at 18UTC on the next day.