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SUMMARY OF THE 2010 TYPHOON SEASON

(Item 6 of the Provisional Agenda)

Submitted by the RSMC Tokyo - Typhoon Center

In the western North Pacific, 14 named tropical cyclones (TCs) formed in 2010, seven of which reached typhoon (TY) intensity (see Table 1). The total is the least since 1951, breaking the previous record of 16 in 1998. After the formation of Omais (1001) in March, TC activities were generally weak through the year (see Figure 1). Particularly, only five named TCs formed south of latitude 20 degrees north and east of longitude 120 degrees east (16.1 is the 30-year average* frequency) (see Figure 2). The mean formation latitude** and longitude** was 18.9˚N and 127.1˚E, showing significant deviation to the west from the 30-year average* (16.2˚N and 136.9˚E).

No named TCs formed from April to June. This is the fourth times since 1951 with 1973, 1975 and 1998.

In July, two named TCs formed around the Philippines and moved westward in the South China Sea (see green lines in Figure 3). Conson (1002) damaged China, the Philippines and Viet Nam.

Out of the nine named TCs formed from August to September (see red lines in Figure 3), eight formed west of longitude 135 degrees east excluding Malakas (1012). Dianmu (1004), Kompasu (1007) and Malou (1009) formed south of Okinawa and moved northward in the East China Sea. Especially, Kompasu damaged the Korean Peninsula. Mindulle (1005) formed in the South China Sea and then moved westward causing damage to Viet Nam. Fanapi (1011) formed south of Okinawa and then moved westward damaging the southern China and Taiwan.

In October, two named TCs formed east of the Philippines (see blue lines in Figure 3). Megi (1013) had developed intensively with a central pressure of less than 900 hPa. After hitting the Philippines, it turned northward in the South China Sea causing damage to the southern China and Taiwan.

From November to December, no named TCs formed. This is the first time since 1951.

* The 30-year average is from 1971 to 2000

** Mean formation latitude (longitude) here is defined as the arithmetic average of the latitudes (longitudes) of genesis points of all TCs of TS intensity or higher

Table 1 List of the tropical cyclones reaching TS intensity or higher in 2010

Tropical Cyclone			Duration (UTC) (TS of higher)			Minimum Central Pressure (UTC)	lat (N)	long (E)	(hPa)	Max Wind (kt)
TS	OMAIS	(1001)	241200 Mar	-	260000 Mar	241200	13.6	133.4	998	35
TY	CONSON	(1002)	120000 Jul	-	180000 Jul	160600	17.6	110.2	970	70
TY	CHANTHU	(1003)	191200 Jul	-	230600 Jul	220000	20.5	111.5	970	70
STS	DIANMU	(1004)	081200 Aug	-	121800 Aug	090300	26.4	125.6	985	50
TS	MINDULLE	(1005)	230000 Aug	-	250000 Aug	240000	18.0	107.3	985	45
STS	LIONROCK	(1006)	281800 Aug	-	020600 Sep	300600	20.8	116.7	985	50
TY	KOMPASU	(1007)	291800 Aug	-	021800 Sep	310000	25.1	129.4	960	80
TS	NAMTHEUN	(1008)	301200 Aug	-	310600 Aug	301200	25.9	122.0	996	35
STS	MALOU	(1009)	040000 Sep	-	080300 Sep	051800	31.4	126.5	992	50
STS	MERANTI	(1010)	081800 Sep	-	101200 Sep	091800	24.3	118.8	985	55
TY	FANAPI	(1011)	151200 Sep	-	201800 Sep	181500	23.8	123.8	930	95
TY	MALAKAS	(1012)	220000 Sep	-	251200 Sep	241800	30.9	142.8	945	85
TY	MEGI	(1013)	131200 Oct	-	231800 Oct	171800	17.6	124.2	885	125
TY	CHABA	(1014)	241800 Oct	-	301800 Oct	280600	24.8	129.2	930	95

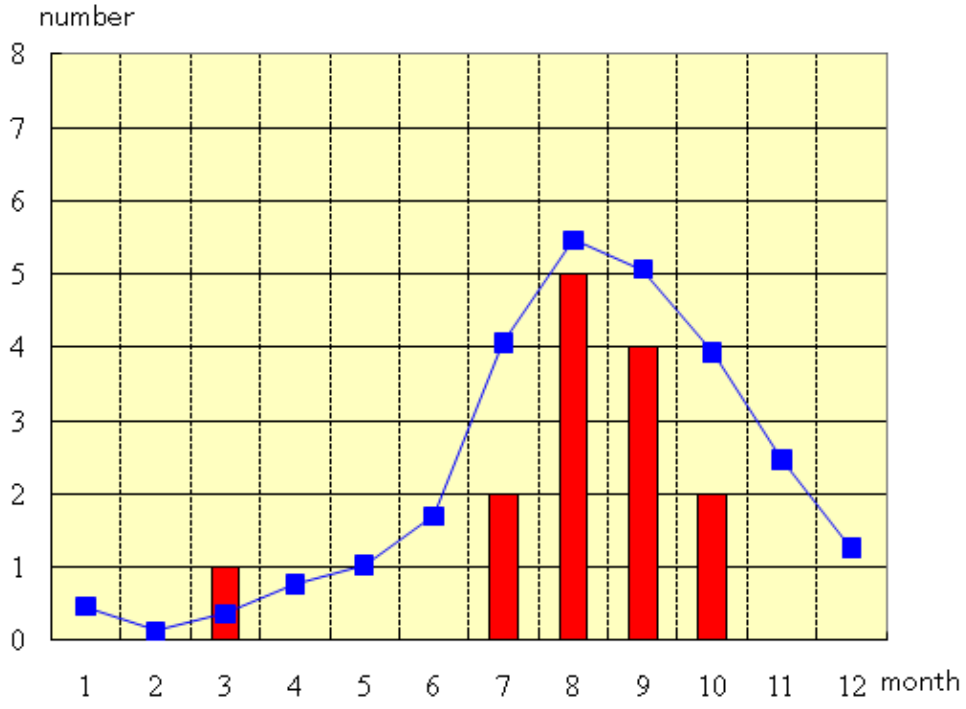

Figure 1 Monthly formation number of named TCs in 2010

Red bar: formation number in 2010, blue line: 30-year average from 1971 to 2000

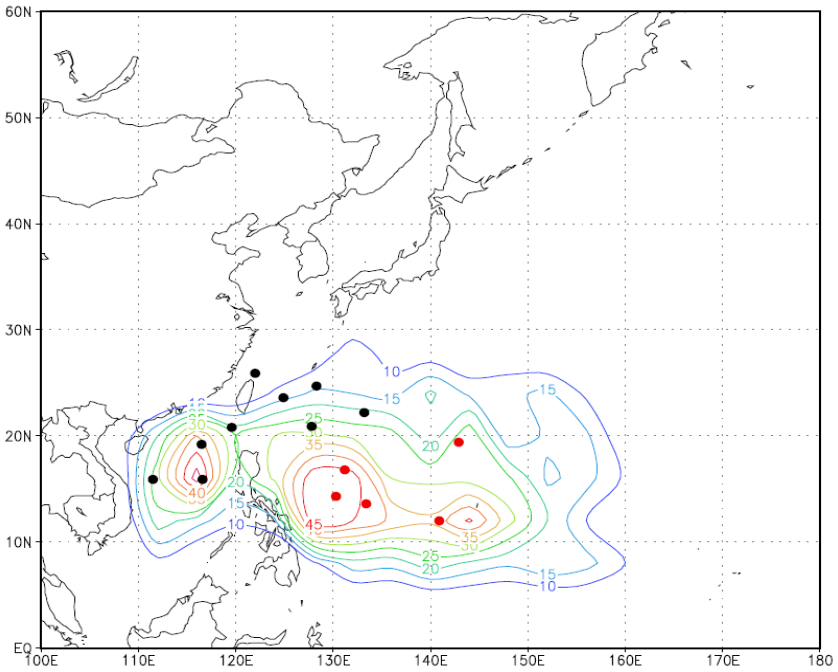

Figure 2　Tracks of Tropical Cyclones in 2010

The numbers represent the genesis points of named TCs (the last two digits of their identification numbers). Red circle: TCs formed south of latitude 20 degrees north and east of longitude 120 degrees east

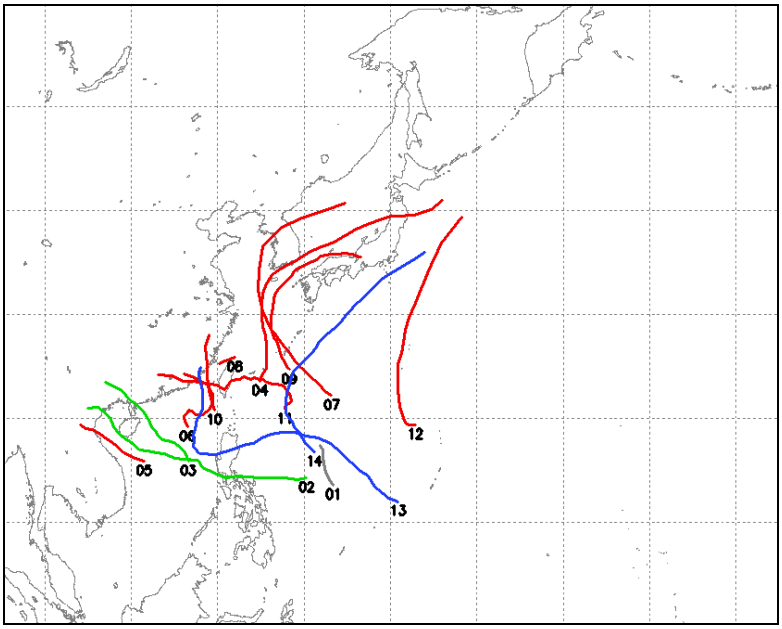

Figure 3　Tracks of Tropical Cyclones in 2010

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

Narrative Accounts of the 14 Named Tropical Cyclones in 2010

OMAIS (1001)

Omais formed as a tropical depression (TD) over the Caroline Islands at 12 UTC on 22 March 2010. Moving west-northwestward over the sea east of the Philippines, it was upgraded to tropical storm (TS) intensity reaching its peak intensity with maximum sustained winds of 35 kt and a central pressure of 998 hPa at 12 UTC on 24 March. Turning gradually north-northwestward, Omais was downgraded to TD intensity east of Luzon Island at 00 UTC on 26 March and remained almost stationary until it dissipated 18 hours later.

CONSON (1002)

Conson formed as a tropical depression (TD) over the sea east of the Philippines at 12 UTC on 11 July 2010. Moving westward with rapid development, it was upgraded to tropical storm (TS) intensity at 00 UTC and typhoon (TY) intensity at 18 UTC the next day. After it crossed Luzon Island, Conson was downgraded to TS intensity at 12 UTC on 14 July. Keeping its westward track in the South China Sea, it was again upgraded to TY intensity at 12 UTC on 15 July and reached its peak intensity with maximum sustained winds of 70 kt and a central pressure of 970 hPa south of Hainan Island 18 hours later. After it moved northwestward over the Gulf of Tonkin and reached the coast of Viet Nam, Conson weakened to TD intensity at 00 UTC on 18 July before dissipating 6 hours later.

CHANTHU (1003)

Chanthu formed as a tropical depression (TD) off the eastern coast of Luzon Island at 06 UTC on 17 July 2010. It moved westward crossing the island and it was upgraded to tropical storm (TS) intensity in the South China Sea at 12 UTC on 19 July. Moving northwestward, Chanthu was upgraded to typhoon (TY) intensity east of Hainan Island at 12 UTC on 21 July and reached its peak intensity with maximum sustained winds of 70 kt and a central pressure of 970 hPa 12 hours later. Keeping its northwestward track, it was downgraded to severe tropical storm (STS) intensity at 18 UTC on 22 July after it reached the southern coast of China. Chanthu weakened to TD intensity at 06 UTC on 23 July and dissipated 12 hours later over the southern China.

DIANMU (1004)

Dianmu formed as a tropical depression (TD) south of the Okinawa Islands at 00 UTC on 7 August 2010. Moving northward, it was upgraded to tropical storm (TS) intensity south of Miyakojima Island at 12 UTC the next day. After approaching the island around 6 hours later,

it reached its peak intensity with maximum sustained winds of 50 kt and a central pressure of 985 hPa in the East China Sea at 03 UTC on 9 August. After turning to the east-northeast, it moved along the southern coast of the Korean Peninsula and was downgraded to TS intensity at 21 UTC the next day. Keeping its east-northeastward track, Dianmu made landfall in the northern part of Honshu around 08 UTC on 12 August with TS intensity. It transformed into an extratropical cyclone south of Hokkaido at 18 UTC that day and dissipated south of the Aleutian Islands 12 hours later.

MINDULLE (1005)

Mindulle formed as a tropical depression (TD) in the South China Sea at 00 UTC on 22 August 2010. Moving west-southwestward, it was upgraded to tropical storm (TS) intensity 24 hours later. Turning gradually west-northwestward and moving into the Gulf of Tonkin, Mindulle reached its peak intensity with maximum sustained winds of 45 kt and a central pressure of 985 hPa at 00 UTC on 24 August. Soon after it hit Viet Nam, Mindulle was downgraded to TD intensity at 00 UTC on 25 August and dissipated around Laos 6 hours later.

LIONROCK (1006)

Lionrock formed as a tropical depression (TD) west of Luzon Island in the South China Sea at 18 UTC on 27 August 2010. Moving northwestward it was upgraded to tropical storm (TS) intensity 24 hours later. After it turned gradually to the east, Lionrock passed around the Pratas Island and it was upgraded to severe tropical storm intensity (STS) at 06 UTC on 30 August. It turned gradually northwestward in the South China Sea, reached the coast of China, and then weakened to TD intensity at 06 UTC on 2 September. It dissipated in the China at 12 UTC on 4 September.

KOMPASU (1007)

Kompasu formed as a tropical depression (TD) southeast of Okinotorishima Island at 12 UTC on 28 August 2010. Moving northwestward, it was upgraded to tropical storm (TS) intensity northwest of the Island at 18 UTC on 29 August. Keeping its northwestward track, Kompasu was upgraded to typhoon (TY) intensity south of Minamidaitojima Island at 18 UTC on 30 August and reached its peak intensity with maximum sustained winds of 80 kt and a central pressure of 960 hPa 6 hours later. Holding its intensity, it crossed the northern part of Okinawa Island after 08 UTC on 31 August and entered the East China Sea. After turning eastward in the Yellow Sea and crossing the Korean Peninsula, Kompasu weakened to TD intensity in the Sea of Japan at 18 UTC on 2 September. It transformed into an extratropical cyclone southeast of Hokkaido at 12 UTC on 3 September after crossing Oshima Peninsula. Turning

north-northeastward over the sea far east of Japan, it crossed longitude 180 degrees east in the Bering Sea before 12 UTC on 6 September.

NAMTHEUN (1008)

Namtheun formed as a tropical depression (TD) north of Ishigakijima Island at 06 UTC on 29 August 2010. Moving northwestward then west-southwestward, it was upgraded to tropical storm (TS) intensity, reaching its peak with maximum sustained winds of 35 kt and a central pressure of 996 hPa north of Taiwan at 12 UTC the next day. Keeping its west-southwestward track, it weakened to TD intensity in the Taiwan Strait at 06 UTC on 31 August and dissipated 12 hours later.

MALOU (1009)

Malou formed as a tropical depression (TD) west of Saipan Island at 12 UTC on 1 September. Moving northwestward, it was upgraded to tropical storm (TS) intensity south of Okinawa Island on 00 UTC on 4 September. During its recurvature, it reached its peak intensity with maximum sustained winds of 50 kt and a central pressure of 992 hPa in the East China Sea at 18 UTC on 5 September. Turning to the east, it crossed Tsushima Island early on 7 September and then made landfall in Japan just before weakening to tropical depression (TD) intensity at 03 UTC the next day. Malou moved east-southeastward in the eastern part of Japan early that day and then dissipated east of Japan at 12 UTC on 10 September.

MERANTI (1010)

Meranti formed as a tropical depression (TD) south of Iriomotejima Island at 00 UTC on 7 September 2010. Moving southwestward and entering into the South China Sea, it was upgraded to tropical storm (TS) intensity at 18 UTC on 8 September. After turning sharply northward, it reached its peak intensity with maximum sustained winds of 55 kt and a central pressure of 985 hPa 24 hours later. It hit southern China and weakened to TD intensity at 12 UTC on 10 September. Accelerating northeastward, it passed the East China Sea on 11 September. Soon after crossing the Korean Peninsula, Meranti transformed into an extratropical cyclone at 00 UTC on 12 September. After moving eastward over the sea of Japan and crossing Tohoku region of Japan, it dissipated east of Japan at 12 UTC on 14 September.

FANAPI (1011)

Fanapi formed as a tropical depression (TD) east of Luzon Island at 18 UTC on 14 September 2010. Moving northwestward, it was upgraded to tropical storm (TS) intensity south of

Okinawa Island at 12 UTC the next day. Turning northward, it was upgraded to typhoon (TY) intensity over the same waters at 18 UTC on 16 September. Turning gradually westward, it reached its peak intensity with maximum sustained winds of 95 kt and a central pressure of 930 hPa south of Iriomotejima Island at 15 UTC on 18 September. Keeping its westward track, Fanapi was downgraded to severe tropical storm (STS) intensity at 12 UTC on 19 September just after crossing Taiwan Island. After crossing the Taiwan Strait and hitting southern China, it weakened to TD intensity north of Hong Kong at 18 UTC on 20 September and dissipated 24 hours later.

MALAKAS (1012)

Malakas formed as a tropical depression (TD) around the Mariana Islands at 06 UTC on 20 September 2010. Moving slowly westward, it was upgraded to tropical storm (TS) intensity west of the Mariana Islands at 00 UTC on 22 September. After turning to the north, it was upgraded to typhoon (TY) intensity at 06 UTC the next day. Keeping its northward track, it reached its peak intensity with maximum sustained winds of 85 kt and a central pressure of 945 hPa southeast of Hachijojima Island at 18 UTC on 24 September. Turning gradually to the northeast, Malakas transformed into an extratropical cyclone east of Japan at 12 UTC the next day. Turning to the east, it crossed longitude 180 degrees east over the Bering Sea before 00 UTC on 28 September.

MEGI (1013)

Megi, the strongest typhoon in recent years, formed as a tropical depression (TD) southwest of Guam at 00 UTC on 13 October 2010. Moving northwestward, it was upgraded to tropical storm (TS) intensity 12 hours later and to typhoon (TY) intensity at 06 UTC on 15 October. Megi turned gradually west-southwestward and developed rapidly reaching its peak intensity with maximum sustained winds of 125 kt and a central pressure of 885 hPa east of the Philippines at 18 UTC on 17 October. It weakened rapidly, although holding TY intensity, when it crossed Luzon Island on 18 October. Megi turned sharply northward over the South China Sea and moved slowly northward with slow development. It weakened to TD intensity at 18 UTC on 23 October soon after it reached the southern coast of Fujian Province of China. Megi dissipated over southern China at 12 UTC on 24 October.

CHABA (1014)

Chaba formed as a tropical depression (TD) east of the Philippines at 18 UTC on 23 October 2010. Moving northwestward, it was upgraded to tropical storm (TS) intensity 24 hours later. After it gradually turned to the northeast, Chaba reached its peak intensity with maximum

sustained winds of 95 kt and a central pressure of 930 hPa south east of Okinawa Island at 06 UTC on 28 October. Accelerating and keeping its northeastward track over the sea south of the Japanese Islands, it transformed into an extratropical cyclone at 18 UTC on 30 October east of Kanto region and dissipated far east of Japan at 06 UTC on 1 November.