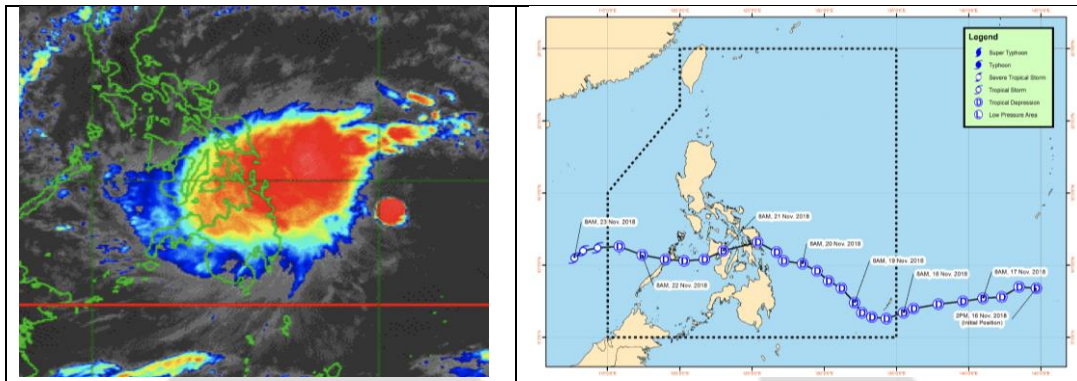


## Tropical Depression SAMUEL (Typhoon USAGI / 1829) Summary Report



Tropical Depression SAMUEL is the 19<sup>th</sup> tropical cyclone (TC) to enter the Philippine Area of Responsibility (PAR) in 2018 and the 1<sup>st</sup> TC for the month of November 2018. The international name “USAGI”, which means *Lepus* or rabbit, was contributed by Japan when the TC became a Tropical Storm upon leaving the PAR. SAMUEL was a landfalling tropical cyclone that remained in the PAR from 18 to 22 November 2018. The TC affected mostly the Visayan islands, portions of southern Luzon and northeastern Mindanao.

### Meteorological History

SAMUEL formed over the Caroline Islands in the central Pacific on 16 November 2018 at 2:00 AM. The TC intensified slightly two days later (8:00 AM, 18 November) when its maximum sustained winds increased from 45 km/h to 55 km/h and then entered the PAR at 10:00 AM. By 19 November, SAMUEL was moving towards Eastern Visayas. The TD made several landfalls across the central part of Philippines (**Table 1**). Its first landfall in Borongan, Eastern Samar resulted in a slight weakening of the system.

**Table 1.** Landfall Chronology of TD SAMUEL while in the PAR

Date and Time of Landfall	Area of Landfall	Estimated Intensity at Landfall
21 November 2018, 2:00 AM	Borongan, Eastern Samar	Tropical Depression, 55 km/h
21 November 2018, 4:00 AM	Daram, Samar	Tropical Depression, 45 km/h
21 November 2018, 5:00 AM	Caibiran, Biliran	Tropical Depression, 45 km/h
21 November 2018, 5:30 AM	Calubian Leyte	Tropical Depression, 45 km/h
21 November 2018, 9:00 AM	Barotac Nuevo, Iloilo	Tropical Depression, 45 km/h
22 November 2018, 1:00 AM	Roxas, Palawan	Tropical Depression, 45 km/h

After five more successive landfalls, SAMUEL emerged into the West Philippine Sea in the morning of 22 November. With no other landmass to interact with in the near term and with improving environmental conditions, the tropical depression gradually re-intensified with maximum sustained winds slightly increasing to 55 km/h by 8:00 AM. At around 6:00 PM that same day, SAMUEL had left the PAR.

In the succeeding hours, SAMUEL continued to intensify as it moved generally westward towards southern Vietnam, with maximum winds reaching Tropical Storm intensity at 8:00 PM (22 November). It eventually reached Typhoon category, with maximum winds of 120 km/h, in the afternoon of 24 November. However, SAMUEL was not able to maintain typhoon intensity because the environment had become increasingly unfavorable. On 25 November, the TC made landfall near Ho Chi Minh City in Vietnam as a weak tropical storm. Further weakening of the system ensued several hours later until it became a tropical depression near the Vietnam – Cambodia border. SAMUEL dissipated over the southern Indochina on 27 November.

The track of SAMUEL is typical for the month of November. Tropical depressions within the PAR during November are nearly as common as tropical storms but nearly a third less common than typhoons.

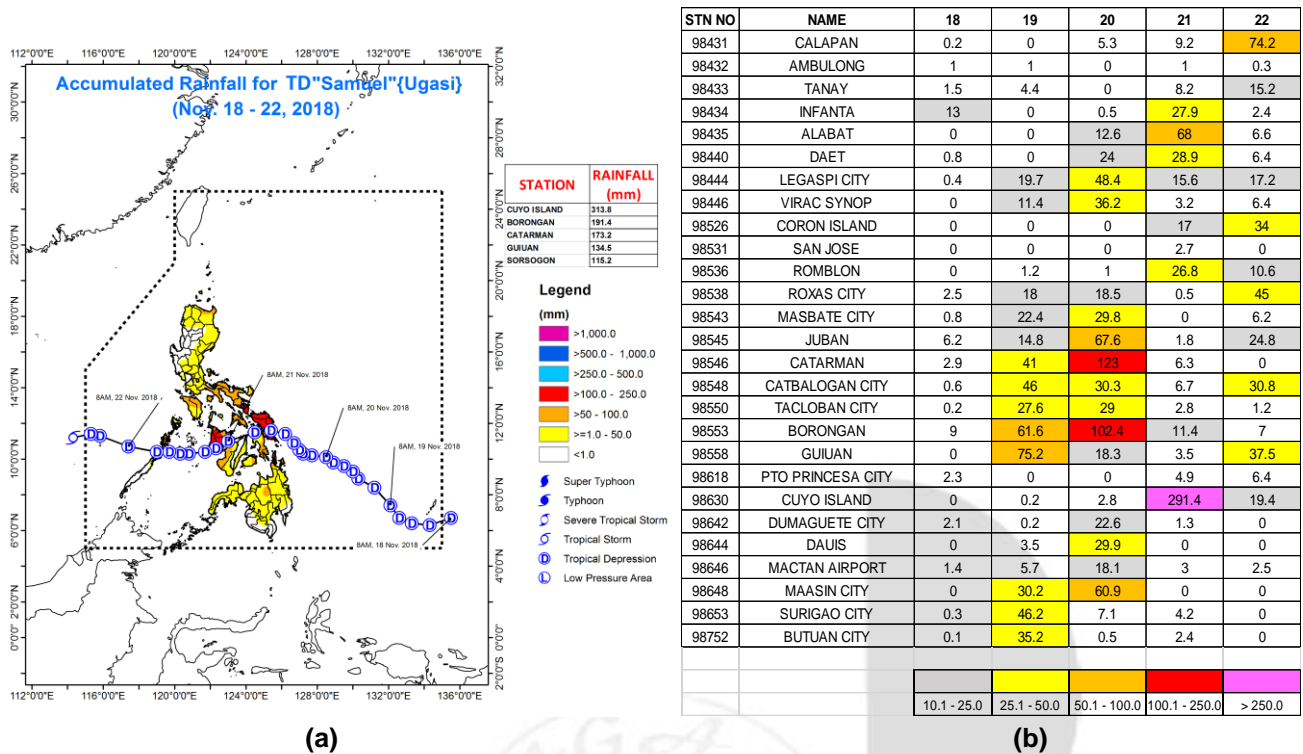
### Significant Meteorological Observations

Reports from weather stations (Table 2) in the Central Philippines show that Cuyo Island station in the Cuyo Archipelago of Palawan recorded the lowest mean sea level pressure during the passage of SAMUEL, reaching 1003.1 hPa at 4:00 PM on 21 November. Meanwhile, the highest wind speed was recorded at Guiuan in Eastern Samar, with a northeasterly gust reaching 61 km/h at 2:39 PM on 20 November.

**Table 2.** Extremes of wind and pressure observations from selected synoptic (manned) stations during 18 to 22 November 2018

Station Name	Lowest MSLP		Peak Gust		
	Date and Time	Value (hPa)	Date and Time	Dir.	Value (km/h)
Surigao City, Surigao del Norte	2018.11.20, 4:00 PM	1007.1	2018.11.20, 10:00 AM	W	22
Maasin City, Southern Leyte	2018.11.20, 4:00 PM	1006.7	2018.11.21, 5:00 AM	SE	18
Tacloban City, Leyte	2018.11.20, 4:45 PM	1004.0	2018.11.21, 5:26 AM	SE	29
Guiuan, Eastern Samar	2018.11.20, 5:00 PM	1006.1	2018.11.20, 2:39 PM	NE	61
Borongan, Eastern Samar	2018.11.20, 6:00 PM	1004.3	2018.11.20, 10:16 AM	NW	43
Catbalogan City, Samar	2018.11.21, 3:00 AM	1004.0	2018.11.20, 10:02 AM	N	54
Catarman, Northern Samar	2018.11.21, 3:00 AM	1005.7	2018.11.20, 5:30 PM	NNE	58
Masbate City, Masbate	2018.11.21, 2:00 AM	1006.1	2018.11.20, 3:53 PM	N	43
Roxas City, Capiz	2018.11.21, 3:00 PM	1006.0	2018.11.21, 1:40 AM	N	43
Romblon, Romblon	2018.11.21, 2:00 PM	1005.3	2018.11.21, 2:00 PM	N	43
Cuyo, Palawan	2018.11.21, 4:00 PM	1003.1	2018.11.21, 1:35 PM	NNE	47
San Jose, Occidental Mindoro	2018.11.21, 4:00 PM	1003.3	2018.11.21, 8:18 PM	SE	47
Puerto Princesa City	2018.11.21, 4:00 PM	1006.3	2018.11.21, 8:00 AM	NNW	18

Rainfall in excess of 100 mm were observed over the northern half of Eastern Visayas, Panay Island, Cuyo Archipelago and Sorsogon. Meanwhile, in excess of 50 mm but below 100 mm were recorded over most of Bicol Region as well the rest of Western Visayas, northern portion of Mindoro Provinces, Marinduque, the southern portion Quezon, Southern Leyte, Surigao del Norte and Dinagat Islands. Most of the areas that experienced heavy rains in excess of 50 or 100 mm were located north of the track of Samuel (**Figure 2a**).



**Figure 2.** (a) Spatial distribution of accumulated rainfall from synoptic station rain gauges for the period 18 to 22 November 2018; (b) daily rainfall accumulated in selected synoptic stations in southern Luzon, Visayas and northeastern Mindanao areas.

The sheared nature of SAMUEL (i.e. clouds with heavy rainfall not concentrated around the center of the TC) during its passage over the central Philippines meant that much of the unsettled weather was situated on the leading edge of the depression. The trailing edge (i.e. eastern portion of the circulation) of the depression generally had better weather condition. This shearing, as well as the interaction of the TD with the northeast monsoon, brought heavy rains in some areas about a day or two ‘before’ the closest approach of the center of SAMUEL. Also, areas located well to the north and west of the center of SAMUEL experienced heavy rains, while the TD was still two days away before landfall. Furthermore, most of Visayas on the 21<sup>st</sup>, especially the western half that was still near the center of the TD (i.e. Roxas City, Capiz), did not experience significant heavy rains.

November 19 and 20 were considered the wettest days during the passage of Samuel. During this period, stations recorded up to 164 mm of rain in 2 days in Catarman and Borongan in Eastern Visayas. However, the highest daily rainfall (24-hour total) was recorded on 21 November in Cuyo island (291.4 mm). This was due to the convective clouds that flared up over the northern Sulu Sea when the TD was passing just south of the Cuyo archipelago. However, this convection did not persist long enough for stations in Palawan to report a daily rainfall that is comparable to that of Cuyo island that same day or the day after.

**Warning Information**

The first standalone information for TD SAMUEL was the initial tropical cyclone advisory (TCA) issued at 11:00 AM on 16 November. Meanwhile, the first Severe Weather Bulletin (SWB) was issued at 11:00 AM on 18 November when SAMUEL had entered the PAR. A total of 29 domestic bulletins, in the form of 3 TCAs and 26 SWBs, were issued throughout the monitoring and warning period. The final SWB and TCA were issued at 8:00 PM on 22 November and at 11:00 AM on 23 November, respectively, at the time when TD SAMUEL exited the PAR and moved further away from the country.

The highest tropical cyclone warning signal (TCWS 1) that was raised in relation to SAMUEL was TCWS #1. This was first warning was raised at 5:00 AM on 19 November over the Surigao Provinces, Agusan del Norte and Dinagat Islands. The entire Visayas, five areas in Luzon and seven areas in Mindanao (a total of 28 areas) were placed under TCWS #1. The last warning signal was lifted at 11:00 AM of 22 November.

### **Preliminary Damage Statistics**

The National Disaster Risk Reduction and Management Council (NDRRMC), in its Situational Report No. 11 dated 27 November 2018, reported a total of 33,771 families or 124,213 persons affected by TD SAMUEL, mainly in Bicol and Eastern Visayas regions. As of 27 November 2018, there were no reported casualties in any of the affected areas. However, a total of Php 52,228,446.00 worth of agricultural damages was reported in Western Visayas, Eastern Visayas and Caraga regions. A total of 1,740 houses in Eastern Visayas were also reported to be damaged with 93 of them suffering total damage.

Note: All dates and times presented in this report are in Philippine Standard Time or PhST (UTC+8).

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#### **Disclaimer**

This report presents a summary of pertinent information obtained during the **operational warning** period. As such, the information presented herein is intended for the general public, not final and subject to change when additional data becomes available.