Tropical Cyclone Report
Tropical Depression Twelve-E
(EP122011)
12 October 2011

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Updated 12 January 2012 to revise the number of direct deaths

Analysis of satellite imagery suggests that Tropical Depression Twelve-E developed from the same tropical wave that produced Atlantic Hurricane Philippe. The wave crossed Central America on 5 October and entered an environment of enhanced low-level westerly flow related to a significant pulse of the Madden-Julian Oscillation (MJO) that was propagating through the eastern Pacific. Within this favorable environment, the wave spawned a well-defined surface low pressure area along the Intertropical Convergence Zone (ITCZ) by 1800 UTC 6 October, centered about 300 n mi south of border between Guatemala and Mexico. The low moved west-northwestward during the next couple of days in an environment of moderate to strong easterly wind shear, while producing intermittent bursts of deep convection. The low slowed down on 8 October and gradually completed a cyclonic loop the next day as the shallow vortex moved within the northward-migrating ITCZ.

Within the anomalous deep-layer westerly flow, the low turned northeastward with an increase in forward speed on 10 October and then northward the next day with little change in organization. The low produced a sustained burst of deep convection late on 11 October, and satellite imagery indicated that the system then acquired sufficient organization to be designated as a tropical depression around 0000 UTC 12 October while located about 160 n mi south-southeast of Salina Cruz, Mexico. The depression continued generally northward and made landfall around 1600 UTC that day along the eastern Gulf of Tehuantepec near Paredón, Mexico. Deep convection rapidly decreased after the depression moved inland, and the cyclone became a remnant low by 0000 UTC 13 October near the border of the Mexican states of Oaxaca and Chiapas, and dissipated a few hours after that.

The genesis of Tropical Depression Twelve-E was not well predicted. The system was introduced into the Tropical Weather Outlook (TWO) with a ‘low’ chance of formation 120 h prior to genesis. Genesis probabilities then increased to a ‘medium’ and a ‘high’ chance 96 and 84 h, respectively, before the system became a tropical cyclone. The magnitude of easterly vertical wind shear remained high during the cyclone’s incipient stage and was not well anticipated. The marginally conducive environment is consistent with the observed, slow tropical cyclone development. Subsequent TWOs lowered the chance of development – just before genesis – with the expectation that the system would either be absorbed into the Pacific ITCZ or move inland.

Torrential rains associated with both the depression and the associated monsoonal-type flow in which it was embedded contributed to severe flooding in portions of southeastern Mexico and Guatemala. Press accounts indicate up to 12 inches (305 mm) of rain fell in portions of Guatemala, although some of this rainfall total may be only partially associated with Tropical Depression Twelve-E. The government of Guatemala issued a State of Public Calamity in response to the flooding and its effects. An official report from the Guatemalan government indicates that 36 deaths can be directly attributed to the depression. Many other deaths were reported in Central America in connection with heavy rains triggered by a pulse of the MJO moving through the basin.

A tropical storm warning was issued at 0900 UTC 12 October for the Pacific coast of Mexico from Barra de Tonala to the Mexican/Guatemalan border. The warning was discontinued at 2100 UTC that day after the depression moved inland.

Table 1. Best track for Tropical Depression Twelve-E, 12 October 2011.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
06 / 1800	9.7	91.7	1009	20	low
07 / 0000	10.1	92.5	1008	20	"
07 / 0600	10.6	93.3	1008	20	"
07 / 1200	10.9	94.1	1008	20	"
07 / 1800	11.1	95.0	1007	20	"
08 / 0000	11.2	95.9	1007	20	"
08 / 0600	11.1	96.4	1007	20	"
08 / 1200	10.9	96.5	1007	20	"
08 / 1800	10.8	96.3	1007	20	"
09 / 0000	10.8	96.1	1006	20	"
09 / 0600	10.8	95.9	1006	20	"
09 / 1200	10.9	95.7	1006	25	"
09 / 1800	11.1	95.5	1006	25	"
10 / 0000	11.2	95.3	1006	25	"
10 / 0600	11.3	95.0	1005	25	"
10 / 1200	11.5	94.7	1005	25	"
10 / 1800	11.7	94.5	1005	25	"
11 / 0000	11.9	94.3	1005	25	"
11 / 0600	12.2	94.1	1005	25	"
11 / 1200	12.6	93.9	1005	25	"
11 / 1800	13.1	93.8	1005	30	"
12 / 0000	13.9	93.8	1004	30	tropical depression
12 / 0600	14.8	93.9	1004	30	"
12 / 1200	15.7	94.1	1005	30	"
12 / 1600	16.2	94.1	1005	30	"
12 / 1800	16.4	94.1	1006	30	"
13 / 0000	16.9	93.9	1007	20	low
13 / 0600					dissipated
12 / 0000	13.9	93.8	1004	30	Maximum winds and Minimum pressure
12 / 1600	16.2	94.1	1005	30	Landfall near Paredón, Mexico

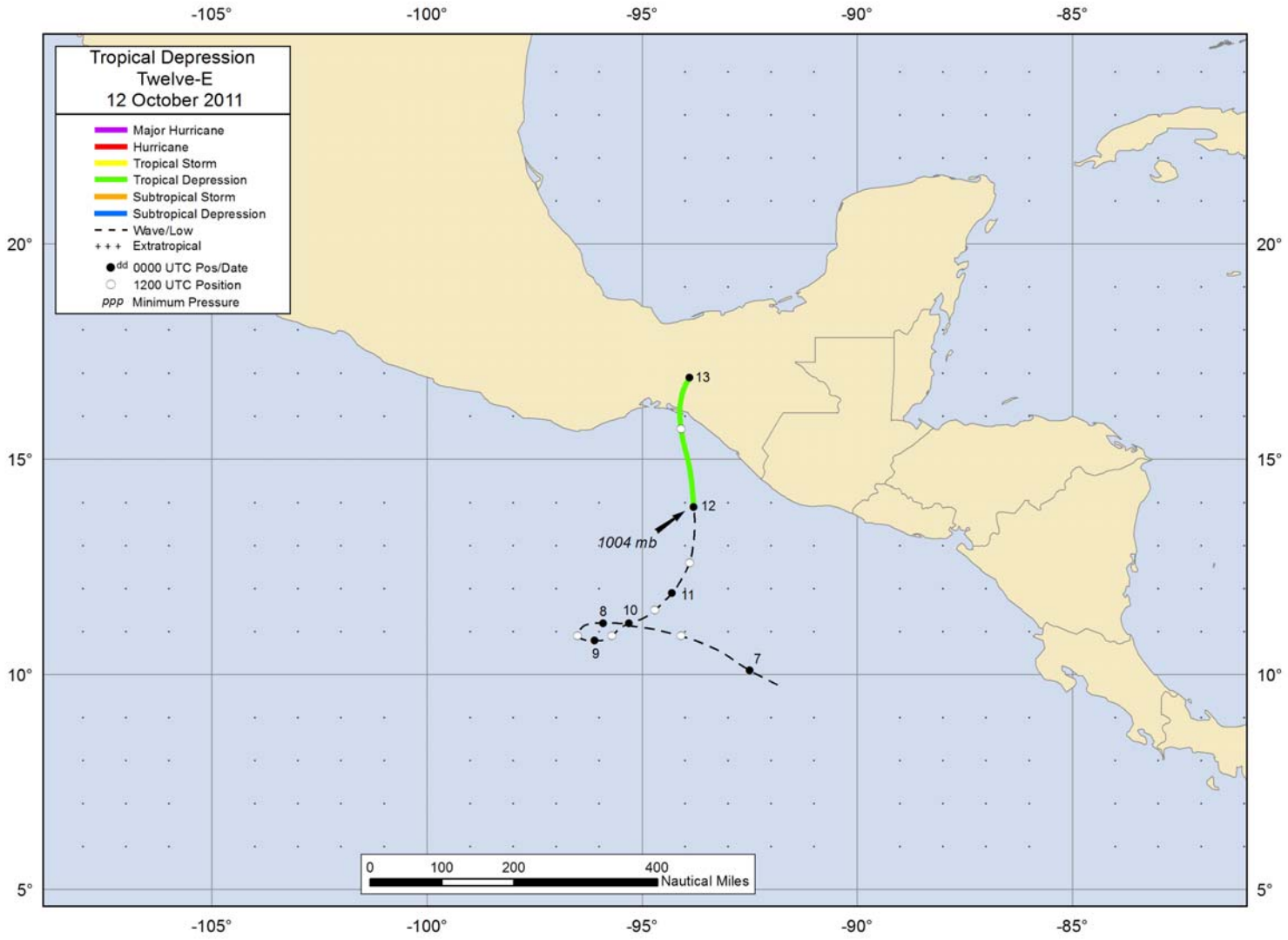

Figure 1. Best track positions for Tropical Depression Twelve-E, 12 October 2011.