

STATE OF THE CLIMATE IN 2010

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accumulated rainfall was registered in the Pedro Méndez dam in Tamaulipas (399.7 mm) and in the La Boca dam in Nuevo León (389.9 mm).

During the second half of August, there were several tropical depressions, which brought intense rain along the southern Pacific coast. Maximum 24-hour precipitation of 360 mm was registered in the mountains of Oaxaca (Cerro de Oro), which caused a landslide and some lives were lost.

Although August 2010 was classified by the National Meteorological Service as the eighth wettest August in 70 years of record keeping, precipitation registered in Chiapas, Oaxaca, Tabasco, and Veracruz caused several damages to the infrastructure and populations of these states.

In September, the government of Veracruz reported damages due to the floods in the region of the Papaloapan river basin; the floods were caused by the continuous precipitation registered from August through the first half of September. During this period, Hurricane Karl affected 114 counties in the state of Veracruz due to strong winds and heavy rain (up to 350 mm in 24 hours in some regions). Two weeks after Karl, the southern region of Veracruz had another impact, this time from the remnants of Tropical Storm Matthew (24–28 September). The station in Coatzacoalcas registered 411.9 mm in 24 hours on 27 September.

c. Central America and the Caribbean

1) CENTRAL AMERICA—J. A. Amador, E. J. Alfaro, H. G. Hidalgo, and B. Calderón

For this region, eleven stations were analyzed from the following six countries: Belize, Guatemala, Honduras, Nicaragua, Costa Rica, and Panama.

(i) Temperature

On the Caribbean side, the year 2010 was warmer than average since it showed a clear pattern of small positive departures with respect to both the 1971–2000 climatology and the last decade (Fig. 7.8). This result appears to be consistent with the persistence of positive sea surface temperature (SST) anomalies in the tropical North Atlantic throughout the year. In contrast, 2010 behaved differently on the Pacific side, where most stations presented a shift to the left in the 2010 distribution, possibly associated with the influence of La Niña conditions in that region. Most stations on the Caribbean side also showed a warmer 2000–09 decade than their corresponding climatology. Two stations on the Pacific side, in southwestern Central

America [Tocumen (Tm6) and David (Tm7)], shared the same characteristics as those on the Caribbean side. The other stations indicated a complex behavior with a shift to the left in the 2000–09 distribution (a cooling effect) in Liberia (Tm8) and practically no significant temperature departures at the other two stations [Cholutera (Tm9) and San Jose Tm10)].

Since many stations have a large amount of missing data in their daily minimum (T_{\min}) and maximum temperatures (T_{\max}), these two variables were analyzed regionally by taking an average of the five stations on the Pacific side and the five stations on the Caribbean side. On the Pacific side, T_{\min} for 2010 indicated small positive departures from the climatology while T_{\max} for 2010 indicated small negative departures. On the Caribbean side, T_{\min} and T_{\max} were slightly warmer than the last decade average but substantially warmer than their climatology.

(ii) Precipitation

The start date (SD) and end date (ED) of the rainy season were calculated at all selected rain-gauge stations. The SDs observed during 2010 were considered near normal when compared with those of the 1971–2000 climatology and 2000–09 decade (Fig. 7.8). The 2010 EDs were early at each station except Tocumen (P6) when compared to the climatology; however, compared to the 2000–09 average, almost all stations had a late ED, except David (P7).

All stations located on the Caribbean side showed that the accumulated precipitation for 2010 was below the 1971–2000 average, except for Tocumen (P6). On the Pacific side, accumulated values for 2010 were greater for Tocumen (P6), David (P7), and San Jose (P10) when compared to 1971–2000 and less for Liberia (P8) and Choluteca (P9).

(iii) Tropical cyclone activity

The year 2010 was very active for tropical storms in the Caribbean basin. By July 2010, La Niña had developed and winds associated with the Caribbean low-level jet were much weaker than normal, an attribute of ENSO cold events in the region and a condition favorable for tropical cyclone development, in addition to the persistent warm SST anomalies observed in the Caribbean and the tropical North Atlantic. There were 13 named storms in the Caribbean (19 in the Atlantic), with seven hurricanes (12 in the Atlantic), and three major hurricanes (five in the Atlantic). Typical observed values, given by the median, in the Caribbean during the last four decades

are four named storms, two hurricanes, and one major hurricane. Additionally, some tropical cyclones landed or reached positions close to the Caribbean Central American coast: Alex (25 June–2 July), Karl (14–18 September), Matthew (23–26 September), Paula (11–15 October), and Richard (21–26 October). Important impacts were reported associated with Tropical Cyclone Nicole (28–30 September) and Hurricane Tomas (29 October–7 November). In contrast, tropical cyclones in the Pacific affected the Central American isthmus less; the first cyclone of the 2010 season, Agatha (29–30 May), made landfall near San Marcos, Guatemala, causing considerable damage and impacting the region, mainly in the northern countries of Central America.

2) THE CARIBBEAN — I. G. García, R. P. Suárez, B. L. Pedrosa, V. C. Cancino, D. B. Rouco, A. L. Lee, V. G. Velazco, T. S. Stephenson, M. A. Taylor, J. M. Spence, and S. Rossi

Countries considered in this region include: Cuba, Jamaica, Puerto Rico, and the U.S. Virgin Islands.

(i) Temperature

For Cuba, 2010 was characterized by warm temperatures, with an annual mean anomaly 0.15°C above normal (1971–2000). The summer temperature neared the 1998 record (1997 and 1998 were the warmest years on record). June was particularly warm, with average temperature more than 1.0°C above normal (Fig. 7.9a). In contrast, the winter months registered below-normal temperatures. December 2010 was the coldest December in 60 years,

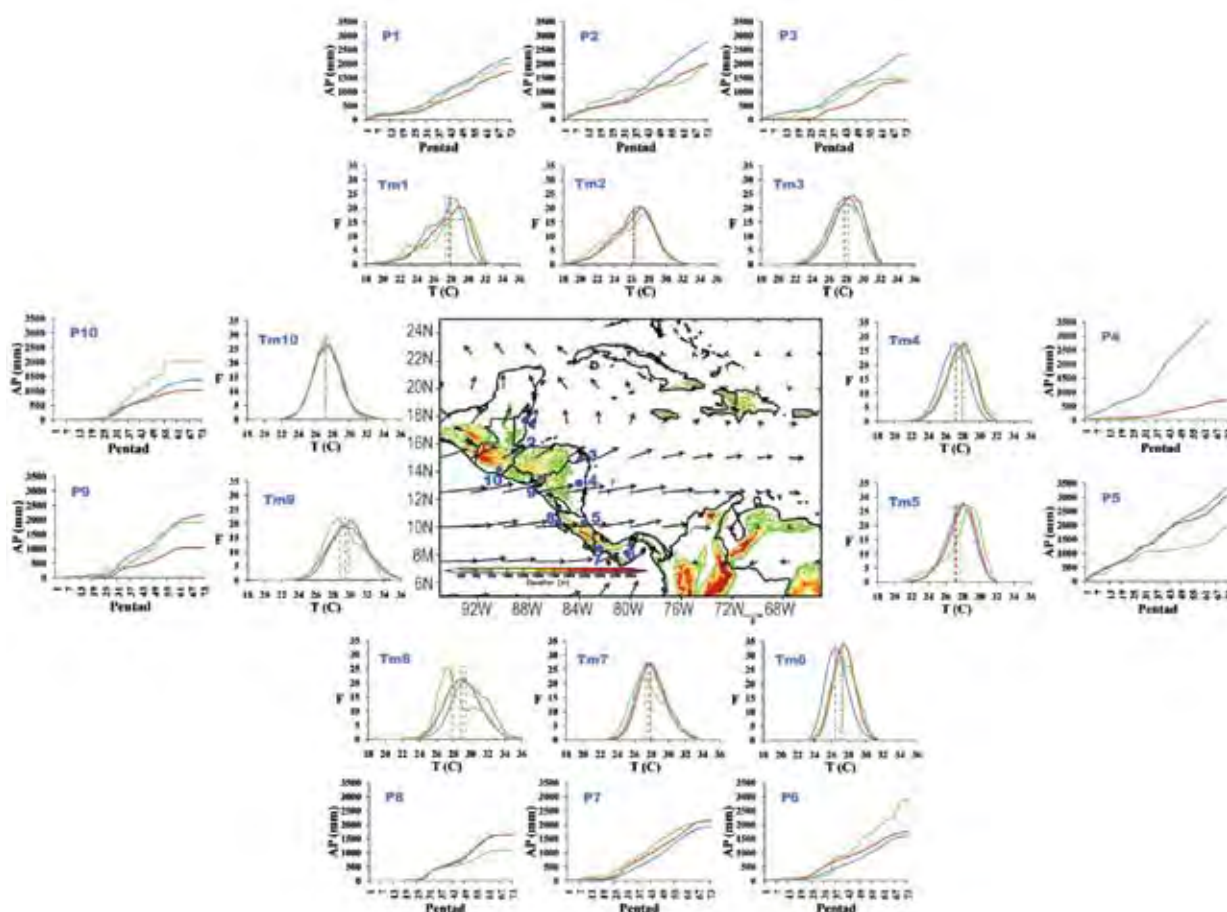


FIG. 7.8. Location of the 10 stations in Central America: (1) Phillip Goldson Int. Airport, Belize; (2) Puerto Barrios, Guatemala; (3) Puerto Lempira, Honduras; (4) Puerto Cabezas-Bluefields, Nicaragua; (5) Puerto Limon, Costa Rica; (6) Tocumen Int. Airport, Panama; (7) David, Panama; (8) Liberia, Costa Rica; (9) Choluteca, Honduras; and (10) San Jose, Guatemala. Wind anomalies at 925 hPa based on 1958–99 for July. Mean surface temperature frequency (TmN) and accumulated pentad precipitation (PN) are shown for each station N. Blue represents the 1971–2000 average (climatology), red the 2000–09 decade, and green 2010. Note that station 4 does not show 2010 precipitation due to a large number of missing data. (Source: NOAA/NCDC.)

