CHAPTER 9.3

Tropical Cyclone Warnings and the Factors that Influence Response: The Trinidad and Tobago Experience

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1 Background

Trinidad and Tobago is a twin-island state located at the southernmost end of the Lesser Antilles, an archipelago of the Eastern Caribbean islands. Its location between 10°N and 11°N (Trinidad) and 11°N and 12°N (Tobago) is mainly responsible for the low frequency of tropical cyclone activity (weak Coriolis factor). This is particularly true for the island of Trinidad which lies furthest to the south.

The National Meteorological Service is comprised mainly of two offices: (a) the forecasting centre at Piarco airport in Trinidad, responsible for Tropical Cyclone Watch and Warning Services, and (b) the observing station at Crown Point airport in Tobago, where the country’s weather Radar System is located.

The radar system in use is a Mitsubishi RC-32B 10 cm weather radar, installed and commissioned in 1970. The radar has a peak power of 540 kW with a maximum range of 500 km (operational range – 300 km). The radar was one of a series of 6 radars installed in the region (Guyana, Tobago, Barbados, Antigua, Jamaica and Belize) and which complemented other existing systems, e.g. in the French islands, to form a virtual ‘radar fence’ to any approaching Tropical systems.

While many of its companion radars have either died or now function at a fraction of their initial capacities, the Tobago radar, through continued maintenance and the competence of its technicians, continues to work well and at almost 100% of its initial capability. It is instructive to note however, that in April 1997, an earthquake measuring 5.4 on the Richter scale damaged the platform supporting the antenna pedestal preventing the rotation of the said antenna for safety reasons. The damaged platform is now in the process of being repaired and it is anticipated that the radar system will be operational in the near future. It was designed by its manufacturers for a ten-year existence, and original spare parts are no longer available. We get along with the utilization of substitute parts.

The Trinidad and Tobago Meteorological Service in addition to its national responsibilities, is also responsible for hurricane watch and warning for the island of Grenada and its dependencies, viz – the islands of Carriacou and Petit Martinique in the southern Grenadines. In the event of a direct and crippling strike to Barbados, another warning centre, the Trinidad and Tobago Service takes over the added warning responsibility for the island of Barbados itself, St. Vincent and the Grenadines (WMO/ TD-no. 494).

The Trinidad and Tobago Service is headed by a Director who assumes final decision-making responsibility during periods of storm/hurricane threat to the area described.
2 Strategies for More Effective Warnings to the Public

Over the years, improvements in the quality and frequency of observation of the physical structure of tropical cyclones have significantly advanced the knowledge of the location, motion, intensity and asymmetry of various parameters in the cyclone circulation. However, a dilemma arises between the increased awareness among meteorologists, with respect to the uncertainties in cyclone behaviour, especially in track prediction, and the heightened expectations of a public that has been conditioned by the performance of more precise scientific disciplines. The public, therefore, finds difficulty in accepting the fact that meteorologists are incapable of a precise answer every time; that there are remaining uncertainties in our science and so uses that disappointment to vent its impatience at prediction errors that cause inconvenience and economic losses.

Track predictions in particular, have for sometime appeared to have plateaued-out in terms of the determination of the mean vector error of predicted location for fixed time periods. Because of this, undesirably large stretches of coastline, or as in the Caribbean situation, large groups of islands (sovereign states in many cases), still have to be placed on alert (full warning phase). A simple comparison of the many numerical prediction models displays the often large variances in predicted locations for the same storm. Nevertheless, there is increasing light at the end of the tunnel, as models slowly display improved performance from year to year.

The challenge, however, remains with how to bridge the gap between public expectancy of high performance and the limitations of scientific predictability. The answer, it appears, lies in the management of meteorological information to the public, from the first stages of cyclone discovery, to the now-casting period surrounding landfall. The public, taken along on this journey, better appreciates the complexities of the ride as partners and is more likely to make allowances for any shortcomings. Information sharing therefore appears to be the key.

3 The Bret Experience

During the episode of tropical storm ‘Bret’ on August 6–7, 1993 the Trinidad and Tobago Meteorological Service experimented for the first time with the live use of the electronic media (TV) to inform its public. Through a series of live television hookups from the meteorological office itself, the Trinidad and Tobago and Grenadian publics participated with rather spectacular results.

It is known, that the population of Trinidad and Tobago (moreso Trinidad) does not have any meaningful history of tropical cyclone experiences, and as such, is subject to a varied range of perceptions and misconceptions, the majority of them fanciful, as they relate to hurricanes. It was also noted that persons without hurricane experience, if informed via the television medium, are best motivated if such warnings are issued by a respected authority figure. In this case, the telecasts done by the Director of the Meteorological Service were quite effective, so much so that the flood of telephone calls to the office, which disrupts work programmes and is normally associated with such events, and which earlier in the day was very much in evidence, virtually ceased. People were beginning to listen. The warning message was getting through. Nevertheless, in the midst of this success, we discovered that the information being disseminated to politicians, the public, the media, disaster management officials etc, was unfortunately also responsible for a whole new set of problems.

4 Problems Associated With Tropical Cyclone Alerts

Timely and accurate warning messages about impending storm conditions, disseminated quickly and effectively to the population at risk, are in themselves ineffective or may generate an inappropriate response if that target population fails to react in a meaningful way. It is at this point that perceptions come into play. The goal of a successful warning system is to mitigate or avoid the destructive effects of tropical cyclones. The individual who takes inappropriate action such as celebrating at hurricane parties, or leaving his fate to the power of