

PRELIMINARY REPORT ON THE EFFECTS OF HURRICANE GERT ON BERMUDA 21st September 1999

Gert's Approach to Bermuda

During the days preceding Bermuda's brush with Gert there had been some fluctuation of the forecast track. Up to the morning of Friday 17th of September the storm had generally been making headway straight for the Island (fig. 1)

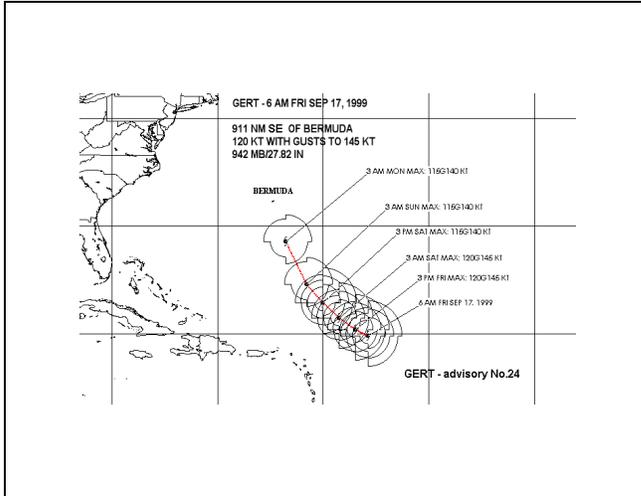


Fig. 1. NHC predicted track
6am ADT 17 Sept 1999

Accordingly, a meeting of the Bermuda Emergency Measures Organisation (EMO) was called that afternoon. The meeting commenced with a weather briefing and discussion on the possible scenarios relating to Gert's future movement. By this time, we had received the NHC midday advisory. Prior discussion with the NHC forecaster indicated that the models were now mostly predicting a jog to the west, with Gert passing to the south of the Island. (fig. 2)

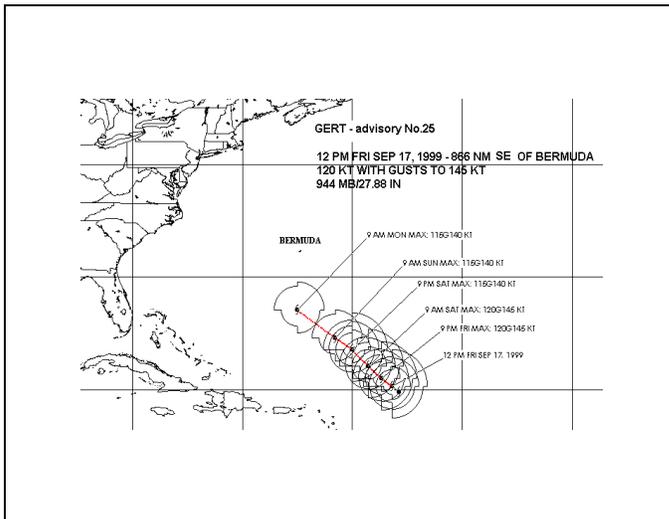


Fig. 2 NHC predicted track
Noon ADT 17 Sept 1999

Although this change of course would, seemingly, appear fortuitous, as far as the Island was concerned, it potentially posed more of a threat in the outlook period. Beyond 72 hours, the storm was likely to recurve northeast, tracking just to west of Bermuda. This would be a scary scenario, exposing the Island to the full force of a major Hurricane's most dangerous quadrant. Additionally, given this track, the large swells and waves, that had already started to batter the south coast, would have a chance to build substantially more.

Emergency Actions

Following the meteorological briefing and discussion, it was decided by the EMO that the Island should go onto a full alert basis. This decision was mainly prompted by the fact that there was a weekend coming up and it was essential that businesses and schools, in particular, were prepared for the possibility of a major Hurricane striking on the Monday or Tuesday. Whatever track the storm finally took, there was the real threat of coastal inundation. A possible storm surge of 3 to 5 feet was predicted with battering seas on top, affecting south coast areas. Therefore, emergency shelters were set up for the inhabitants of dwellings at risk. The Health Services and Salvation Army were ready for action and contingency child care was arranged for health workers. The Bermuda Regiment was called for full duty, as well as the Police and reserve Police. Finally, the Works and Engineering Department had all their crews standing by for road clearing, etc.

Gert Brushes By

As it turned out, Gert resumed a more northward over the weekend and was predicted to recurve just east of the Island. (fig. 3.)

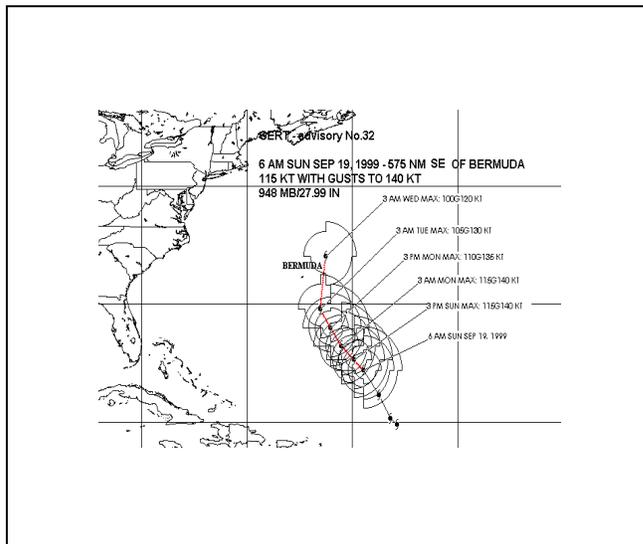


Fig. 3. NHC track prediction at 6 am ADT 19th Sept 1999

With a more organised steering flow, Gert now began to behave herself (at least in a meteorological sense) and it then became a question of just how closely she would pass by to the east. A Tropical Storm warning and Hurricane watch were issued on the evening of the 19th and upgraded to a Hurricane warning on the following morning. By

this time, there were signs of a gradual weakening of the system, but Gert was still a large Category 3 Hurricane with the potential to cause severe damage if she tracked over or close to the east of Bermuda as the latest satellite imagery showed (fig. 4.). In the event, Gert finally skirted the Island approximately 120 nm. to the east around the late morning of the 21st, having weakened to a Category 2 storm by this time.

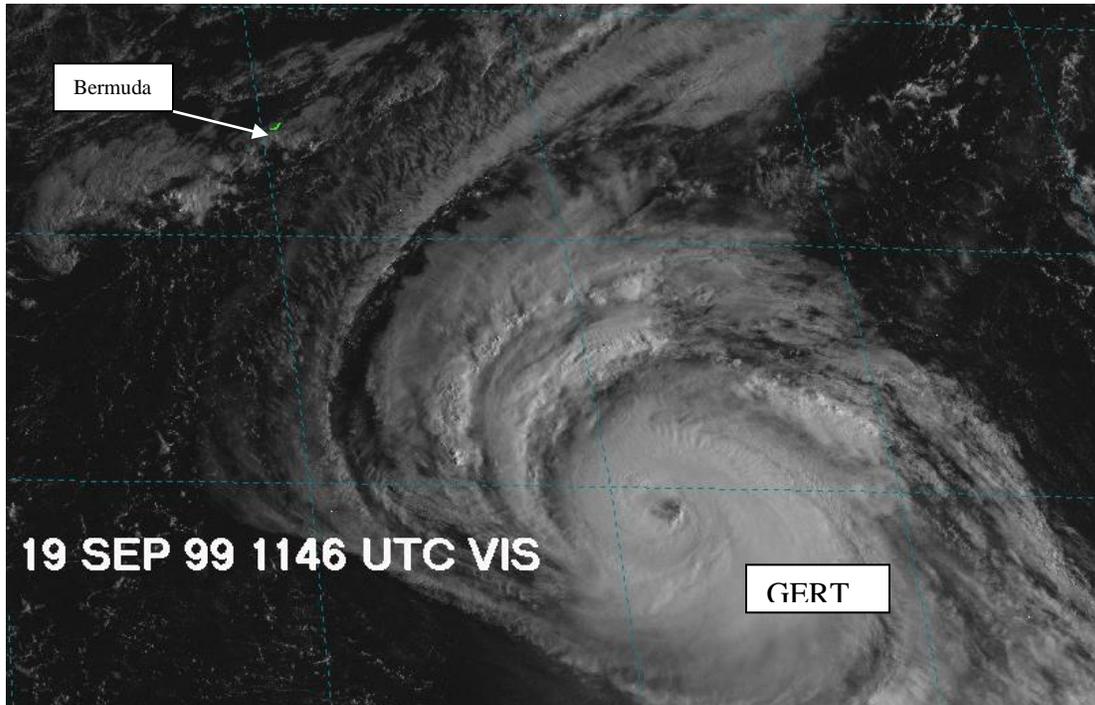


Fig. 4. Satellite Imagery of Gert 19th Sept 1999 at 1146 UTC (GOES 8)

Despite missing the Island by this relatively large margin, Hurricane force gusts were briefly experienced at the Airport (fig. 5.), although mean (10 minute) speeds were only into the Tropical Storm category. It should be noted that the airport anemometer is relatively sheltered from northeast, which was the predominate wind direction as Gert passed by. Records from the more exposed Harbour Radio anemometer (fig. 6.) revealed substantially higher wind speeds, with Hurricane force (1 minute mean) wind speeds recorded for several hours during the morning. Harbour Radio (RCC Bermuda) is located on a ridge of hills at the north east of Bermuda, directly north of the airport. The anemometer height is approximately 200 feet above sea level which might also explain the higher winds experienced at this location, bearing in mind recent findings in relation to tropical cyclone wind speed variations with height in the lower levels of the atmosphere.

Fig. 5.

Bermuda Airport Winds & Gusts during Hurricane Gert

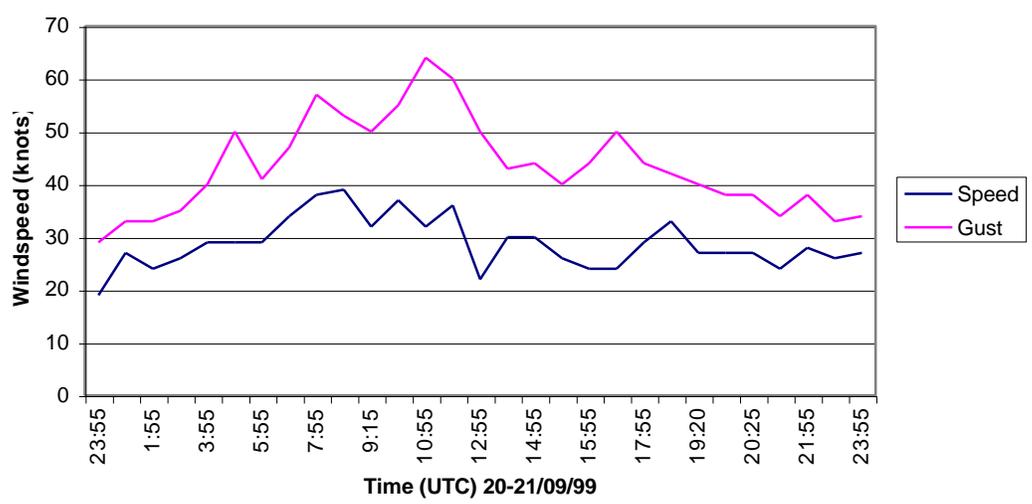
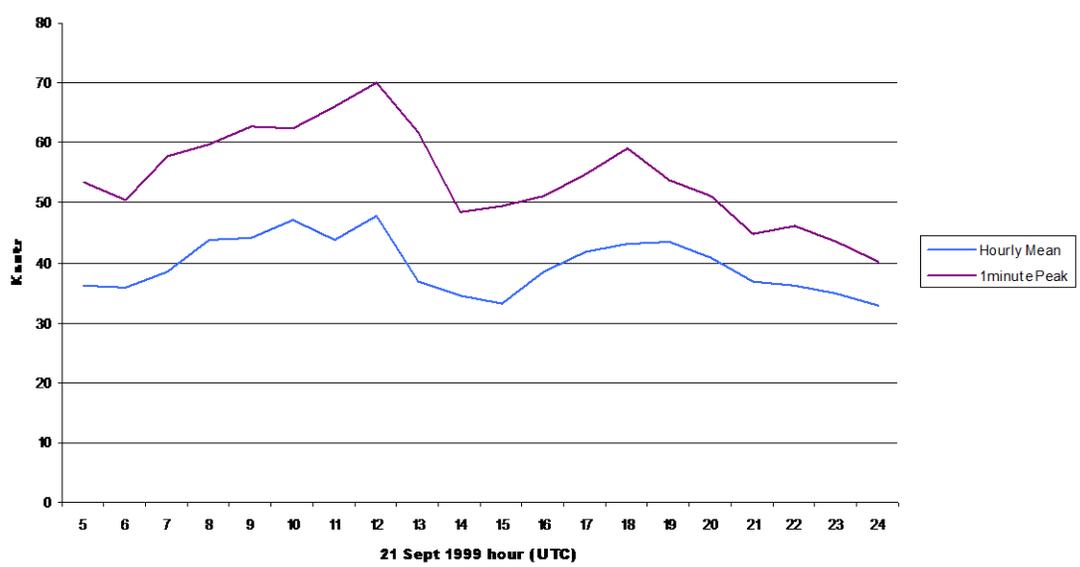


Fig. 6.

Harbour Radio - Gert Wind Speeds



Both records showed a second peak in the wind speeds during the afternoon, which may have been in association with a peripheral rain band, brushing by as the storm moved away northeast. Rainfall totals were quite low, with most of the heavier convection showing to the east of the storm. Only 0.53 inches of rain were recorded at the airport.

Storm Damage

Bermuda's houses are well built to withstand hurricane winds. Although there was some minor wind damage this was confined mostly to broken branches causing power line failures together with several vessels breaking their moorings. Most of the damage was due to the heavy pounding surf and high seas (25 to 30 ft waves were reported) which affected the south and east coast beaches and which alone justified the Hurricane warning. There was substantial coastal erosion and an unconfirmed figure of around 1100 dwellings or structures affected by flooding or wave damage. There was also evidence of a storm surge of around 2 to 3 feet above normal sea levels. On the socio-economic front, schools and most businesses were closed on the Tuesday, together with the airport. Many Bermudians held their traditional "Hurricane Parties".

Conclusions

Although Gert eventually spared Bermuda, with the inevitable gripes from some that the Government had over reacted, the storm posed a useful reminder to everyone of the Island's vulnerability. A direct hit from a strong category 3 storm or higher would prove devastating to the Island, whatever precautions were taken. Bermuda has not experienced a really major storm for many decades. Even the swift moving, tornado spawning Emily, in 1987, was essentially only a category one storm. If nothing else, Gert provided us with a most useful real time Hurricane exercise, from which it was evident that most of the emergency plans had worked well.