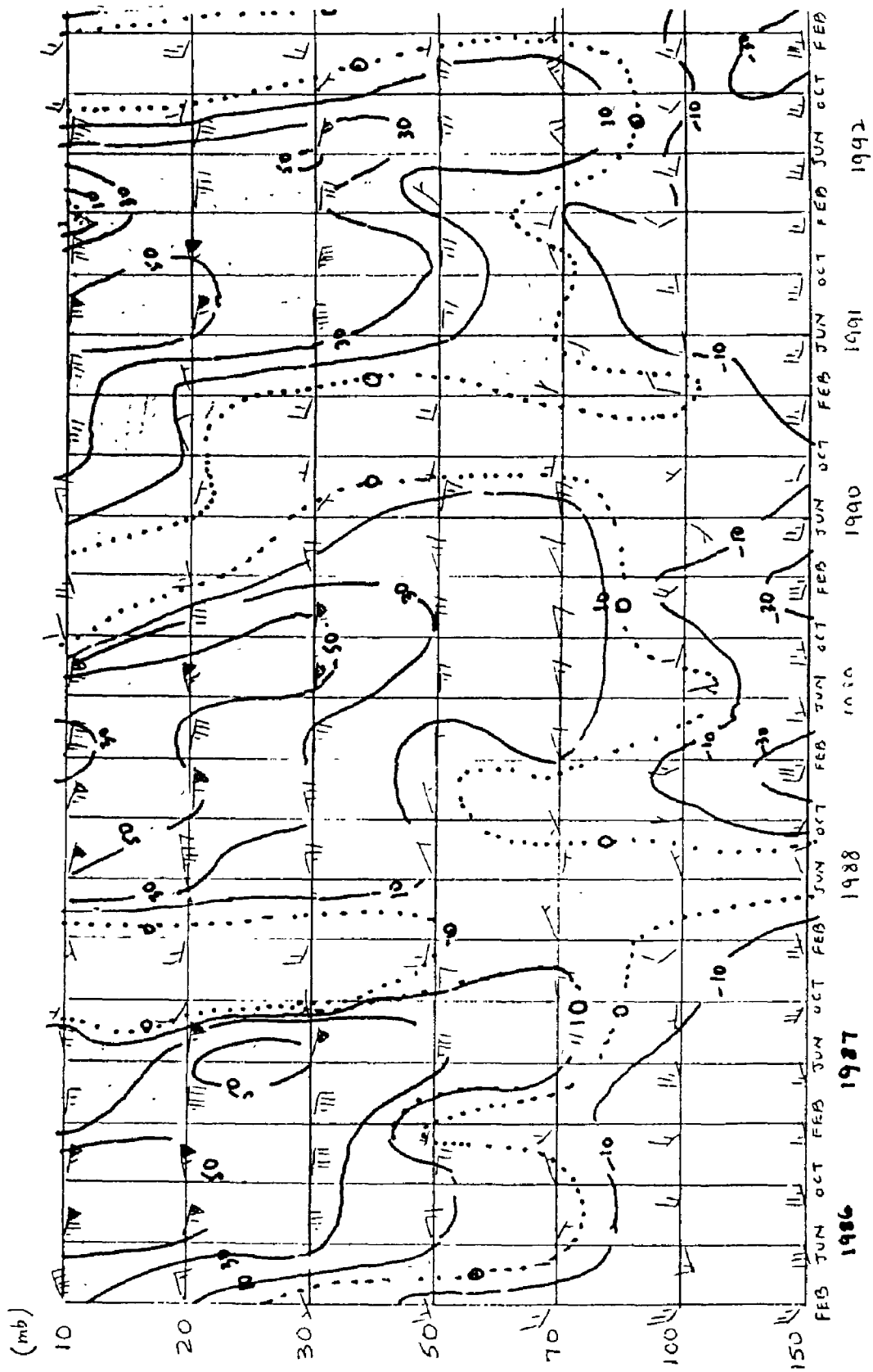

Figure 7: Time-height section depicting the quasi-biennial oscillation for Piarco, Trinidad, for Feb. 1986-Feb 1993. Isoplets are monthly mean wind speeds in knots. Positive values denote easterly winds.

region are substantially higher than those along Atlantic coastal areas of the West Sahel region.

Caribbean Basin Sea Level Pressure Anomaly and
Upper Tropospheric (200 mb) Zonal Wind Anomaly

Atmospheric pressure changes are generally linked to changes in the weather. Falling sea level pressures often give rise to unsettled weather. Negative values of the Caribbean basin sea level pressure anomalies for April and May imply enhanced seasonal tropical cyclone activity. Zonal wind (the east-west wind component) at the 200 mb (12 km) level of the Caribbean is another useful indicator. Negative anomalies for April and May also imply enhanced tropical cyclone activity ahead. The El Nino influence (seen to lessen tropical cyclone activity) reflects changes in the 200 mb windflow over the Caribbean basin.

Result

To date, nine tropical cyclones (named storms) form on average (1958-1984) in the North Atlantic - Caribbean Sea - Gulf of Mexico Basin. To forecast the actual number for an on-coming season, Prof. Gray uses an empirical statistical model that adds to nine the number obtained by summing the expected contribution of each of the five predictors named. Contributions typically lie between -2 and +2. If the value obtained is greater than 9, enhanced tropical cyclone activity is forecast (Gray, 1983), and that means something to the Caribbean meteorologist.

The intensity of the cyclones are also determined by noting substantial changes in some of the parameters, for example, increased rainfall in West Africa, definite withdrawal of the ENSO, etc.

Conclusion

1. Tropical cyclone activity in the Caribbean Basin is strongly influenced by regional and global factors.

2. The Circum-Caribbean Region, including Trinidad and Tobago, lies in the direct path of destructive tropical cyclones. It's inhabitants, therefore, must protect themselves against this natural hazard.

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A Hurricane Surge Prediction Model for the Eastern Caribbean

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Abstract

The Sea, Lake and Overland Surge from Hurricanes (SLOSH) model of Jelesnianski et al. is adapted to the Eastern Caribbean by use of a novel regional basin. The model runs on a desktop computing platform and should be accessible to authorities on most of the smallest islands. Further modification to a parallel version for implementation on a multiprocessor platform should allow realtime monitoring and prediction during an actual hurricane. Results for model storms are presented and compared, where data exist, with actual measurements.

Landslide Hazard Analysis in Hilly Tropical Terrain - Trinidad & Tobago

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Abstract

Analysis of landslide hazards along roads (cut-slopes) and slopes in residential areas (cut and fill slopes) require an understanding of the causes and the driving mechanisms that contribute to unstable conditions. In Trinidad and Tobago landslide occurrence along roads, including crowded hillslope residential areas, though not as catastrophic as other hazards (hurricanes, earthquakes and floods) result in heavy damage and related costs to engineering structures (roads, houses, etc.) and may take lives.

In both islands, the interaction of many factors including variation in rock type (schists, phyllites, sandstone, tuffs, diorite and andesite), rock fabric (schistocity and jointing), weathering characteristics (weathering profiles), slope form and drainage systems (subwatersheds), and climatic factors (rainfall etc.), contribute to instability. Innovative analytical techniques can be applied to data derived from the systematic registration of landslide characteristics to identify the unfavourable conditions.

- In the Northern Range, the application of statistical techniques of slope characteristics and rock fabric from road cuts have been used to identify conditions contributing to instability along roads. Deforestation, schistocity and slope orientation, and rainfall generate various size landslide types. Discriminant and Cluster Analysis indicate that two volumetric landslide groups can be selected and used for prediction and planning purposes.

- Along the "mountain front" in the Chaguaramas area, use of a three dimensional subwatershed model revealed that parallelism of slope orientation and rock fabric orientation, deforestation, that created imbalances in the watershed system generated both rock and debris slides along the roadway. The model can be applied throughout the Range for identifying potentially unstable zones both along roads and in the residential areas.

- In Tobago, investigations after Tropical Storm Danielle revealed that the larger deep-seated landslides (debris slides) occurred within the weathered metamorphic rocks. These slides, in general, affect road communication to villages and may even incur high cost to the road structure. The shallower landslides, however, occurred within slopes cut in weathered volcanic rock.

The application of these techniques in landslide hazard analysis provides reliable information which can be used for mitigation and the development of a computerized system for landslide hazard management.