

Sea Surface Temperature (SST) in the Caribbean Sea and the Hurricanes in the U.S. Gulf Coast

Dongmeipan and C. Vipulanandan, PhD., P. E.
Texas Hurricane Center for Innovative Technology (THC-IT)
Department of Civil and Environmental Engineering
University of Houston, Houston, TX 77204-4003
Tel: 713-743-4291; email: dpan3@uh.edu

Abstract: Relationship between monthly mean sea surface temperature (SST) and hurricane originating from the Caribbean Sea was analyzed. It was determined that all the hurricanes from Caribbean sea occurred in the Gulf Coast in the U.S when the monthly mean (SST) of the Caribbean Sea were no less than 28°C and above the long-term monthly mean.

1.Introduction

The link between changes in the temperature of the sea surface and increased North Atlantic hurricane activity has been quantified for the first time. The research was performed by the scientists at UCL (University College London) showed that a 0.5°C increase in sea surface temperature can be associated with an approximately 40 per cent increase in hurricane activity. (Science Daily, 2008). Hence it was of interest to investigate the hurricanes in the U.S Gulf Coast and the SST in the region.

2.Objectives

The objective of this study was to investigate the relationship between monthly mean (SST) and hurricanes which came from the Caribbean Sea and struck the Gulf of Coast in the U.S.

3.Temperature Analyses

The data of hurricane, monthly mean, and long term monthly mean (SST) in Caribbean sea were collected from NOAA (<http://www.noaa.gov/>) and analyzed to determine the correlation between hurricanes and SST.

Table 1. SST (°C) and Hurricanes came from Caribbean Sea and reached the U.S Gulf Coast (1982-2010)

Year	Beginning Month	Storm Name	Max Category	Monthly means(1982-2010)	Long Term Monthly Means(1971-2000)	SST Change
1985	August	ELENA	H3	28.4	28.3	0.1
1985	August	DANNY	H1	28.4	28.3	0.1
2004	August	CHARLEY	H4	28.3	28.3	0
2004	September	JEANNE	H3	29.0	28.7	0.3
2005	July	CINDY	H1	29.1	27.9	1.2
2005	July	DENNIS	H4	29.1	27.9	1.2
2005	September	RITA	H5	29.6	28.7	0.9
2005	October	WILMA	H5	29.7	28.7	1.0
2008	July	DOLLY	H2	28.0	27.9	0.1
2008	August	GUSTAV	H4	28.7	28.3	0.4

In Table 1, there have been 10 hurricanes which originated from the Caribbean sea and struck the Gulf Mexico from 1982 to 2010 and the landfall months of these hurricanes were from July to October which is included in the hurricane season of North Atlantic Basin (from June to November). And the frequency of hurricane has increased greatly from 2 hurricanes in the past 22 years from 1982 to 2003 to 8 hurricanes in 7 years from 2004 to 2010. And the category of 5 of 8 hurricanes was more than 3, there is an increasing trend in the intensity of hurricane from 1982 to 2010. In Figure 1, 10 hurricanes from

July to October in Table 1 all occurred When the monthly mean (SST) were above 28C. Compared to long term monthly means of SST, the monthly mean (SST) all were no less than long term monthly (SST) in the month when hurricanes occurred.

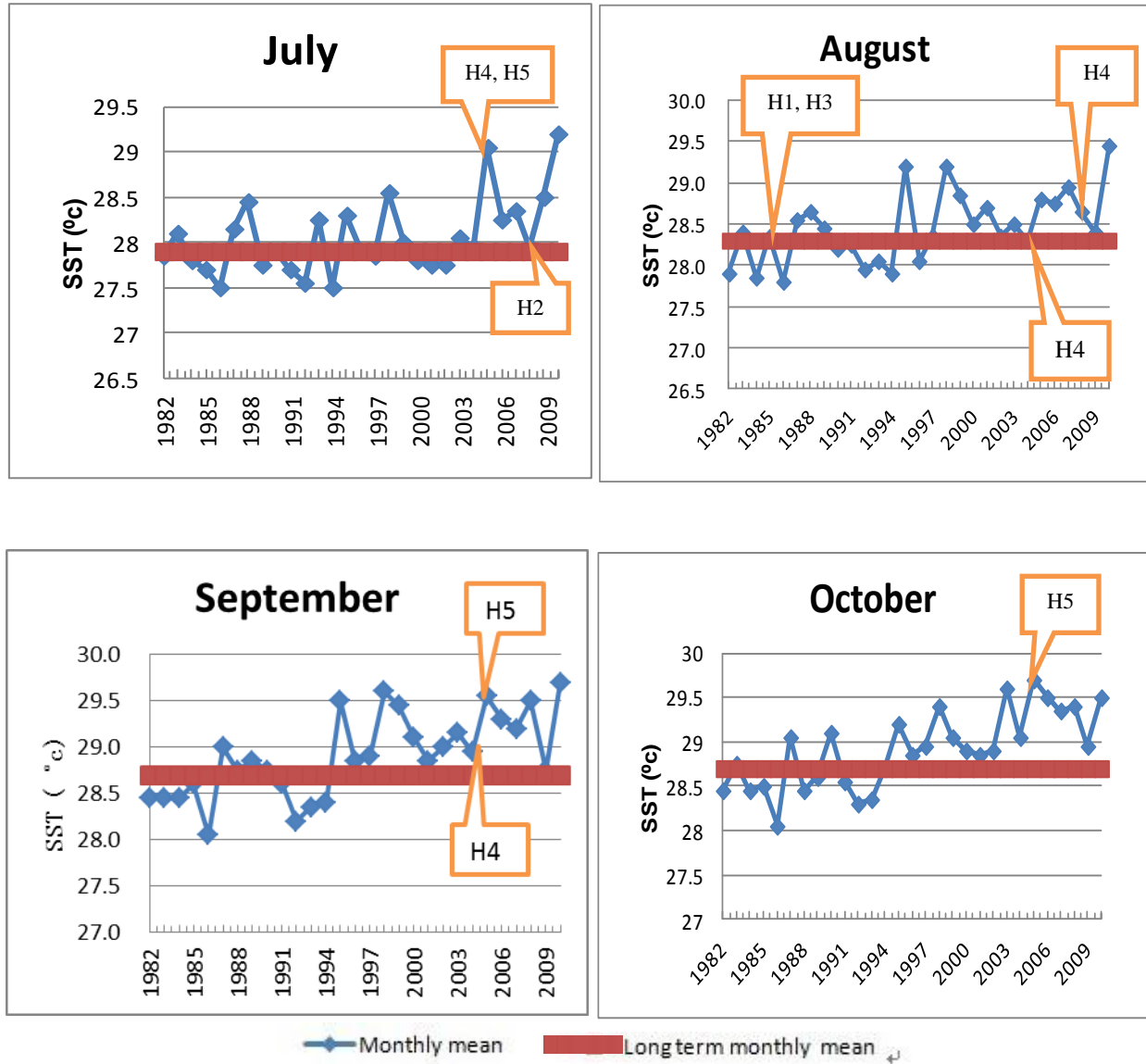


Figure 1. Monthly mean and long term monthly mean (SST) in July, August, September and October (1982-2010)

4. Conclusion

In the past 29 years, when the hurricanes came from Caribbean sea reached the U.S Coast, all of monthly mean SST were above 28°C. At the same time, monthly mean SSTs were not less than long term monthly means SST, and the difference varied from 0 to 1.2°C.

5. Acknowledgement

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