

Comparing the Year 2012 Hurricane Predictions for Gulf Coast and Texas

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Abstract: Total hurricanes for 2012 in the Atlantic region predicted by the Colorado State University (CSU), Florida State University (FSU) and National Oceanic and Atmospheric Administration (NOAA) varied from 4-8. Based on THC-IH prediction, the probability of one hurricane for Texas and Gulf of Mexico in 2012 varied from 17.6%-38.8% and 0.02%-36.6% respectively.

1. Introduction

Several institutions keep predicting the hurricane probability and total number for the Atlantic hurricane season each year. CSU has been predicting hurricane for the past 29 years. The CSU Tropical Meteorology Project has made forecast of the upcoming season's Atlantic basin hurricane activity. Its research team has shown that a sizable portion of the year-to-year variability of Atlantic tropical cyclone (TC) activity can be hindcast with skill exceeding climatology. This year's June forecast was based on a statistical methodology derived from 29 years of past data. The Center of FSU for Ocean-Atmospheric Prediction Studies (COAPS) in the College of Arts and Sciences was officially formed in August 1996 by the Florida Board of Regents. COAPS is a center of excellence performing interdisciplinary research in ocean-atmosphere-land-ice interactions to increase our understanding of the physical, social, and economic consequences of climate variability. The Texas Hurricane Center for Innovative Technology (THC-IT) has developed in hurricane prediction based 161 years of data with a Poisson distribution and started to predict hurricane for Gulf of Mexico (GOM) and every state along GOM since 2009. Total hurricane for year 2011 predicted by CSU, FSU and NOAA varied from 6 to 10. For year 2011, THC-IH predicted probability of no hurricane for Texas and GOM varied from 35%-92% and 12.4%-86.6% respectively, and there was no hurricane in Texas or GOM. The Climate Prediction Center (CPC) of NOAA are operational predictions of climate variability, real-time monitoring of climate and the required data bases, and assessments of the origins of major climate anomalies.

2. Objectives

The objective was to review and summarize the hurricane predictions by the CSU, FSU and NOAA for 2012 Atlantic hurricane season. Also the probabilities of hurricanes predicted by the THC-IH for Texas and Gulf Coast of the United States in 2012 are compared to other predictions.

3. Analyses

Hurricane prediction by CSU, FSU, NOAA for 2012 Atlantic hurricane season are summarize and remarked in Table 1(TNS-total number of storms; H-number of hurricanes). Compared to the actual hurricane number in the past three years, the predictions matched well with the actual number. For Frequency of Hurricane per year, $f(h)=\exp(-\lambda)x\lambda^h/h!$; ($h=0,1,2,\dots$), where h is the number of hurricane per year, λ is the expected number of hurricanes during a year. By analyzing 161 data (1851-2011) from NOAA, the parameter λ for Texas and the Gulf Coast of the United States were 0.36 and 1.2. It means the probability for hurricane in Texas and the Gulf Coast of the United States is 0.36 and 1.1 each year respectively. The probability of h hurricanes occurring in T years is, $f(h|\lambda, T)=\exp(-\lambda T)x(\lambda T)^h/h!$; ($h=0,1,2,\dots$), prediction of hurricane probability in 2012 is based on different year cycles ($T = 1,2,\dots, 10$)

simulation and calculations (Liu and Vipulanandan,2010; Elsner and Bossak,2001).

Table 1 Hurricane Prediction of Atlantic Hurricane Season by FSU, NOAA, and CSU
(TNS: Total Named Storms, H: Hurricane)

Year	FSU		NOAA		CSU		Actual number	Remark
	TNS	H	TNS	H	TNS	H	H	
2012	13	7	70% chance of 9-15	70% chance of 4-8	10	4	unknown	unknown
2011	17	9	12-18	6-10	16	9	7	close to real number
2010	17	10	14-23	8-14	18	10	12	close to real number
2009	8	4	9-14	4-7	11	5	3	close to real number

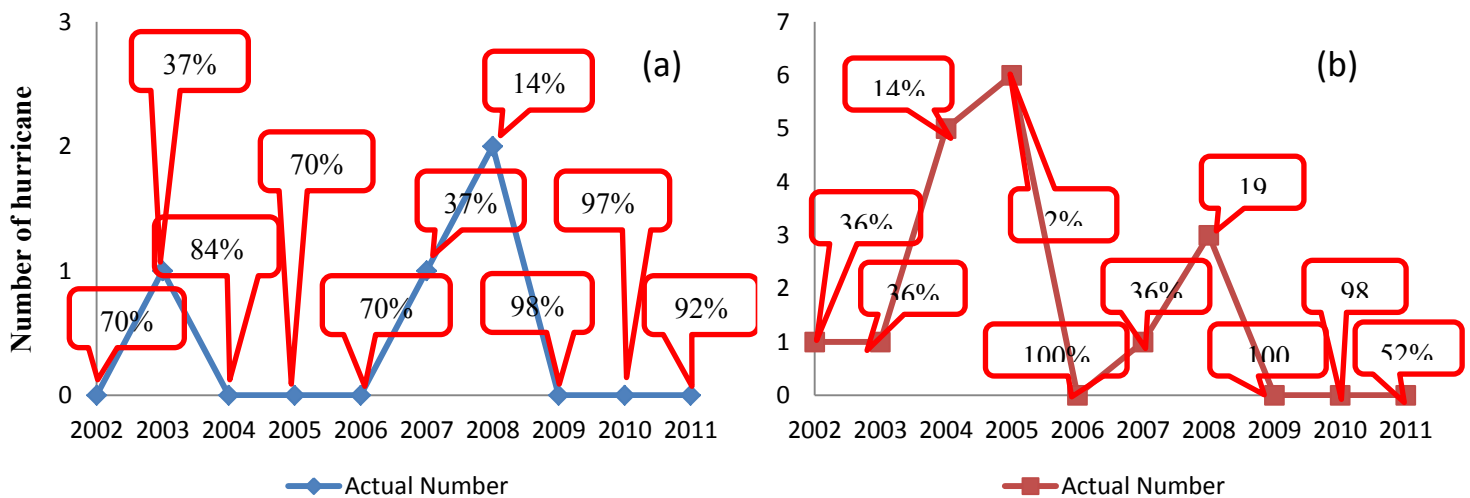


Figure 1 Actual Hurricanes and Probability Predicted by THC for the past decade (a) Texas and (b) U.S. Gulf Coast

4. Conclusions

According to the prediction by CSU, FSU and NOAA, 2012 Hurricane numbers varied and between 4 and 8. Based on the past 161 years of data, predictions by THC-IH for hurricane in the last three years have been good. The frequency of hurricanes in Texas and Gulf Coast of the United States was 0.36 and 1.1 per year. There is a higher probability of no hurricanes in Texas in 2012. The probability of one hurricane in Texas varied from 17.6 to 38.8%. The probability of a second hurricane varied from 4.5% to 27%. The probability of zero hurricanes in U.S Gulf Coast varied from 1.8% to 53% this year. The probability of one hurricane along the Gulf of Mexico varied from 0.02% to 36.6%. The probability of a second hurricane varies from 0.1% to 26.8%.

5. Acknowledge

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6. References

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