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VERIFICATION OF THE OCSI ATLANTIC HURRICANE PREDICTIONS SINCE 1985

By:

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1. INTRODUCTION

The Orbital Cyclone Strike Index [OCSI®] is based on the premise that the orbit of the Sun about the center of gravity of the solar system has an influence on the general circulation of the earth's atmosphere. This influence is reflected in the paths of Atlantic tropical cyclones. Freeman and Hasling (2002) have recently pointed out that this orbit of the sun is shared by the earth. Jose (1969) and Landscheidt (1976) found that the orbit of the Sun is related to solar activity including the sun spot cycle. This seems to indicate that there are orbital influences reflected in the solar activity.

2. OCSI

The OCSI starts with the year when the sunspot minimum occurs. This year is Phase 1 of the index. The year after the sunspot minimum would be Phase 2 and so on to Phase 10. There are a few years in Phase >10. This process creates the OCSI index. The years used in the index started with the 1878 sunspot minimum through 1985.

The Atlantic tropical cyclone data is then sorted into the index to determine which sections of the US coast has the most years with landfalls in each Phase. The probabilities are given for each section of the US coast by phase. The probability was computed by taking the number of years out of 10 that a storm made landfall on that particular section of coast line. This information is used to make a prediction of which section had the highest risk of experiencing a tropical cyclone landfall each year as well as which sections had the second highest risk. Forecasts have been made each year since 1985. Forecasts were also verified for the years 1856 to 1877.

Table 1 gives verifications of these forecasts from 1985 to 2003. A forecast verifies with landfall in any of the sections with the highest probability of landfall. In the past 19 years there have only been 2 years when a storm did not make landfall in any of the sections with the highest probability. This gives you an accuracy of 90%. An alternate verification would consider the 54 forecasts in the 19 years made of the coast with the highest or the

second highest risk. There were 16 times when a storm did not make landfall for one of these forecasts. In other words, there were 16 missed forecasts out of the 54 forecasts with an accuracy rate of 70%.

3. WRC's FORECAST COMPARED TO GRAY'S FORECAST

In order to compare the OCSI with other Atlantic Seasonal hurricane outlooks, secondary predictions were made of the number of tropical cyclones, number hurricanes, number of tropical storm days, number of hurricane days each year. These forecasts were compared to climatology as well as Colorado State Professor Bill Gray's Annual Forecasts.

This verification of the twenty years of forecast demonstrates that WRC's OCSI model is as accurate if not more accurate than Gray's model. The advantage of the OCSI model is that WRC's model can make a prediction years in advance. Table 2 gives a summary of the forecasts comparisons. For details see <http://www.wxresearch.com/outlook/hur2004.htm>.

WRC forecast the number of storms each year and this forecast was verified for the past 20 years. There were eight years out of the twenty years when the forecast was within plus or minus one storm. Gray's forecast was only within one storm five of the twenty years and climatology was only within one storm two of the twenty years.

WRC forecast the number of hurricanes each year. The forecast verified within one hurricane ten out of the twenty years and Gray's method forecast within one hurricane eight of the twenty years. WRC forecast the number of hurricane days each year. This verified within five days eight out of the twenty years. Gray's method forecast the number of hurricane days within five days six out of the twenty years and climatology was five out of the twenty years. WRC's then forecast the number of storm days. This verified within ten days for ten of the twenty years. Gray's model forecast the number of days within ten days for seven of the twenty years and climatology five out of the twenty years.

Table 1: OSCI Verification

	Year	Highest	Second
1	1985	TX 70% W FL 70%	GA-NC 60%
		Kate	Bob Isabel
2	1986	GA/NC 90%	W. FL 70%
		Charley	Charley
3	1987	LA/AL – 70%	W. FL 60% GA-NC 60%
		X	Floyd
4	1988	W. FL 90%	MEX 70% E FL 70%
		Keith	Gilbert - Debby Chris
5	1989	LA-AL 90% WFL 90%	TX 70% GA-NC 70%
		Allison	Allison-Chantal Hugo Jerry
6	1990	W FL 60% GA-NC 60% LA-AL 60%	
		Marco	
7	1991	W FL 70% LA-AL 70%	GA-NC 60%
		Fabian	Bob
8	1992	W FL 80%	LA-AL 60% TX 60%
			Andrew
9	1993	NE US 70% GA-NC 70%	
		Emily	
10	1994	W FL 70%	TX 60%
		Alberto Beryl Gordon	
11	1995	TX 70% W FL 70%	GA-NC 60%
		Dean Allison Erin Opal	
12	1996	GA-NC 90%	W FL 70%
		Arthur – Bertha – Fran	Josephine
13	1997	LA-AL 70%	W FL 60% GA-NC 60%
		Danny	Danny
14	1998	W FL (90%)	MEX 70% E FL 70%
		Earl Mitch	Mitch
15	1999	LA-AL 90% WFL 70%	GA-NC 70% TX 70%
		Harvey Irene	Floyd Bret
16	2000	W FL 70% LA-AL 70%	GA-NC 60%
		Gordon/Helene Gordon	
17	2001	W FL 70% LA-AL 70%	GA-NC 60%
		Gabrielle Allison	Allison
18	2002	W FL 80%	LA-AL 60% TX 60%
		Hanna	Isidore - Lili Fay-Bertha
19	2003	NE US 70% GA-NC 70%	
		Isabel Isabel	

Table 2. Summary of Model Comparison

# of Storms in Atlantic within 1 storm	WRC OCSI 8 Years	Climatology 2 years	Gray Atlantic Season 5 years
# hurricanes in Atlantic within 1 storm	10 years	5 years	8 years
# of hurricane days with 5 days	8 years	4 years	6 years
# of storm days within 10 days	10 years	5 years	7 years