



# July Forecast Update for Atlantic Hurricane Activity in 2002

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## Forecast Summary

**TSR predicts a below average activity Atlantic hurricane season with levels well under the 1992-2001 average and similar to those last seen in 1997**

The TSR (Tropical Storm Risk) early July forecast update for Atlantic hurricane activity in 2002 continues to anticipate levels well below the 1992-2001 average. The forecast relates to the Atlantic season from 1st June 2002 to 30th November 2002 and is based on data available through the end of June. Another downward revision of forecast activity has been necessary this month - the fifth consecutive month this has happened. This is due to forecast Niño 3.4 sea surface temperatures (SSTs) again warming more quickly than anticipated and to Caribbean and tropical north Atlantic SST anomalies continuing to decline. This implies that Atlantic/Caribbean trade winds in the crucial July-September period will be stronger than usual and coupled with cooler tropical north Atlantic SSTs, activity levels will be suppressed further than previously thought. Appendices show our predictions from preceding months.

### Atlantic Total Numbers in 2002

		<u>Intense Hurricanes</u>	<u>Hurricanes</u>	<u>Tropical Storms</u>
TSR Forecast ( $\pm$ FE)	2002	0.9 ( $\pm$ 1.6)	3.1 ( $\pm$ 1.5)	6.8 ( $\pm$ 2.3)
10yr Climate Norm ( $\pm$ SD)	1992-2001	2.9 ( $\pm$ 2.0)	6.9 ( $\pm$ 2.9)	11.5 ( $\pm$ 4.1)
30yr Climate Norm ( $\pm$ SD)	1972-2001	2.1 ( $\pm$ 1.5)	5.7 ( $\pm$ 2.4)	9.5 ( $\pm$ 3.6)
Forecast Skill at this Lead	1987-2001	20%	24%	35%

Key: Intense Hurricane = 1 Minute Sustained Wind > 95Kts = Hurricane Category 3 to 5  
Hurricane = 1 Minute Sustained Wind > 63Kts = Hurricane Category 1 to 5  
Tropical Storm = 1 Minute Sustained Wind > 33Kts  
SD = Standard Deviation  
FE (Forecast Error) = Standard Deviation of Errors in Simulated Real Time Forecasts 1992-2001  
Forecast Skill = Percentage Improvement over Running 10-year Prior Climate Norm from Simulated Real Time Forecasts 1987-2001

### Total Numbers Forming in the MDR, Caribbean Sea and Gulf of Mexico in 2002

		<u>Intense Hurricanes</u>	<u>Hurricanes</u>	<u>Tropical Storms</u>
TSR Forecast ( $\pm$ FE)	2002	0.9 ( $\pm$ 1.5)	1.3 ( $\pm$ 1.7)	3.6 ( $\pm$ 2.4)
10yr Climate Norm ( $\pm$ SD)	1992-2001	2.9 ( $\pm$ 2.0)	5.1 ( $\pm$ 3.0)	8.3 ( $\pm$ 4.3)
30yr Climate Norm ( $\pm$ SD)	1972-2001	1.8 ( $\pm$ 1.6)	3.8 ( $\pm$ 2.5)	6.4 ( $\pm$ 3.7)
Forecast Skill at this Lead	1987-2001	25%	33%	42%

The Atlantic hurricane Main Development Region (MDR) is the region 10°N - 20°N, 20°W - 60°W between the Cape Verde Islands and the Caribbean. A storm is defined as having formed within this region if it reached at least tropical depression status while in the area.

## USA Landfalling Numbers in 2002

		Hurricanes	Tropical Storms
TSR Forecast ( $\pm$ FE)	2002	0.7 ( $\pm$ 0.9)	1.6 ( $\pm$ 1.2)
10yr Climate Norm ( $\pm$ SD)	1992-2001	1.2 ( $\pm$ 1.2)	3.3 ( $\pm$ 1.8)
30yr Climate Norm ( $\pm$ SD)	1972-2001	1.2 ( $\pm$ 1.3)	2.6 ( $\pm$ 1.8)
Forecast Skill at this Lead	1987-2001	18%	35%

Key: Landfall Strike Category = Maximum 1 Minute Sustained Wind of Storm Coming Within 30km of Land  
 USA Mainland = Brownsville (Texas) to Maine

USA landfalling intense hurricanes are not forecast since we have no skill at any lead.

## Caribbean Lesser Antilles Landfalling Numbers in 2002

		Intense Hurricanes	Hurricanes	Tropical Storms
TSR Forecast ( $\pm$ FE)	2002	0.2 ( $\pm$ 0.4)	0.3 ( $\pm$ 0.6)	0.7 ( $\pm$ 0.8)
10yr Climate Norm ( $\pm$ SD)	1992-2001	0.3 ( $\pm$ 0.5)	0.7 ( $\pm$ 0.8)	1.5 ( $\pm$ 0.9)
30yr Climate Norm ( $\pm$ SD)	1972-2001	0.2 ( $\pm$ 0.4)	0.4 ( $\pm$ 0.6)	1.1 ( $\pm$ 1.0)
Forecast Skill at this Lead	1987-2001	17%	19%	20%

Key: Landfall Strike Category = Maximum 1 Minute Sustained Wind of Storm Coming Within 30km of Land  
 Lesser Antilles = Island Arc from Anguilla to Trinidad Inclusive

## Key Predictors for 2002

The key factors behind our forecast for a significantly below average hurricane season in 2002 are the anticipated stronger than normal July-September forecast 925mb U(east/west)-winds over the Caribbean Sea and tropical north Atlantic region (7.5°N-17.5°N, 30°W-100°W), and the cooler than average August-September forecast SST anomalies for the Atlantic MDR. Against a 1972-2001 climatology, the current forecast anomalies for these two predictors are  $-0.86 \pm 0.50 \text{ ms}^{-1}$  (compared to  $-0.70 \pm 0.49 \text{ ms}^{-1}$  last month) and  $-0.21 \pm 0.14 \text{ }^\circ\text{C}$  (down from  $-0.15 \pm 0.18 \text{ }^\circ\text{C}$  last month).

## Further Information

Further information on the TSR forecast methodology, the TSR simulated real-time forecast skill 1987-2001 as a function of lead time, and on TSR in general, may be obtained from the 'Extended Range Forecast for Atlantic Hurricane Activity in 2002' document issued on the 3rd December 2001. Our next monthly forecast update for the 2002 Atlantic hurricane season will be issued on the 6th August 2002.



## Appendix - Predictions from Previous Months

### 1. Atlantic Total Numbers

<b>Atlantic Total Numbers 2002</b>				
		Named Tropical Storms	Hurricanes	Intense Hurricanes
Average Number ( $\pm$ SD) (1992-2001)		11.5 ( $\pm$ 4.1)	6.9 ( $\pm$ 2.9)	2.9 ( $\pm$ 2.0)
Average Number ( $\pm$ SD) (1972-2001)		9.5 ( $\pm$ 3.6)	5.7 ( $\pm$ 2.4)	2.1 ( $\pm$ 1.5)
TSR Forecasts ( $\pm$ FE)	8 July 2002	6.8 ( $\pm$ 2.3)	3.1 ( $\pm$ 1.5)	0.9 ( $\pm$ 1.6)
	7 June 2002	7.5 ( $\pm$ 2.1)	3.6 ( $\pm$ 1.6)	1.1 ( $\pm$ 1.4)
	7 May 2002	8.9 ( $\pm$ 2.7)	4.6 ( $\pm$ 1.9)	1.6 ( $\pm$ 1.5)
	5 Apr 2002	11.2 ( $\pm$ 3.1)	6.3 ( $\pm$ 2.3)	2.4 ( $\pm$ 1.9)
	6 Mar 2002	12.5 ( $\pm$ 3.6)	7.2 ( $\pm$ 2.5)	2.8 ( $\pm$ 1.9)
	6 Feb 2002	13.6 ( $\pm$ 3.5)	8.0 ( $\pm$ 2.5)	3.2 ( $\pm$ 1.8)
	10 Jan 2002	13.1 ( $\pm$ 3.6)	7.7 ( $\pm$ 2.6)	3.0 ( $\pm$ 1.8)
	3 Dec 2001	13.0 ( $\pm$ 3.6)	7.5 ( $\pm$ 2.5)	3.0 ( $\pm$ 1.6)
Gray Forecasts	31 May 2002	11	6	2
	5 Apr 2002	12	7	3
	7 Dec 2001	13	8	4

### 2. MDR, Caribbean Sea and Gulf of Mexico Total Numbers

<b>MDR, Caribbean and Gulf of Mexico Total Numbers 2002</b>				
		Named Tropical Storms	Hurricanes	Intense Hurricanes
Average Number ( $\pm$ SD) (1992-2001)		8.3 ( $\pm$ 4.3)	5.1 ( $\pm$ 3.0)	2.9 ( $\pm$ 2.0)
Average Number ( $\pm$ SD) (1972-2001)		6.4 ( $\pm$ 3.7)	3.8 ( $\pm$ 2.5)	1.8 ( $\pm$ 1.6)
TSR Forecasts ( $\pm$ FE)	8 July 2002	3.6 ( $\pm$ 2.4)	1.3 ( $\pm$ 1.7)	0.9 ( $\pm$ 1.5)
	7 June 2002	4.3 ( $\pm$ 2.3)	1.8 ( $\pm$ 1.5)	1.1 ( $\pm$ 1.4)
	7 May 2002	5.7 ( $\pm$ 2.6)	2.8 ( $\pm$ 1.8)	1.6 ( $\pm$ 1.5)
	5 Apr 2002	8.0 ( $\pm$ 3.2)	4.5 ( $\pm$ 2.3)	2.4 ( $\pm$ 1.8)
	6 Mar 2002	9.3 ( $\pm$ 3.7)	5.4 ( $\pm$ 2.5)	2.8 ( $\pm$ 1.8)
	6 Feb 2002	10.4 ( $\pm$ 3.6)	6.2 ( $\pm$ 2.4)	3.2 ( $\pm$ 1.7)
	10 Jan 2002	9.9 ( $\pm$ 3.8)	5.9 ( $\pm$ 2.6)	3.0 ( $\pm$ 1.8)
	3 Dec 2001	9.8 ( $\pm$ 4.1)	5.8 ( $\pm$ 2.7)	3.0 ( $\pm$ 1.7)

### 3. US Landfalling Numbers

<b>US Landfalling Numbers 2002</b>			
		Named Tropical Storms	Hurricanes
Average Number ( $\pm$ SD) (1992-2001)		3.3 ( $\pm$ 1.8)	1.2 ( $\pm$ 1.2)
Average Number ( $\pm$ SD) (1972-2001)		2.6 ( $\pm$ 1.8)	1.2 ( $\pm$ 1.3)
TSR Forecasts ( $\pm$ FE)	8 July 2002	1.6 ( $\pm$ 1.2)	0.7 ( $\pm$ 0.9)
	7 June 2002	1.8 ( $\pm$ 1.3)	0.8 ( $\pm$ 0.9)
	7 May 2002	2.3 ( $\pm$ 1.4)	1.1 ( $\pm$ 1.0)
	5 Apr 2002	3.0 ( $\pm$ 1.6)	1.4 ( $\pm$ 1.1)
	6 Mar 2002	3.5 ( $\pm$ 1.7)	1.7 ( $\pm$ 1.1)
	6 Feb 2002	3.8 ( $\pm$ 1.7)	1.9 ( $\pm$ 1.1)
	10 Jan 2002	3.7 ( $\pm$ 1.8)	1.8 ( $\pm$ 1.1)
	3 Dec 2001	3.7 ( $\pm$ 1.3)	1.8 ( $\pm$ 1.1)

### 4. Lesser Antilles Landfalling Numbers

<b>Lesser Antilles Landfalling Numbers 2002</b>				
		Named Tropical Storms	Hurricanes	Intense Hurricanes
Average Number ( $\pm$ SD) (1992-2001)		1.5 ( $\pm$ 0.9)	0.7 ( $\pm$ 0.8)	0.3 ( $\pm$ 0.5)
Average Number ( $\pm$ SD) (1972-2001)		1.1 ( $\pm$ 1.0)	0.4 ( $\pm$ 0.6)	0.2 ( $\pm$ 0.4)
TSR Forecasts ( $\pm$ FE)	8 July 2002	0.7 ( $\pm$ 0.8)	0.3 ( $\pm$ 0.6)	0.2 ( $\pm$ 0.4)
	7 June 2002	0.8 ( $\pm$ 0.8)	0.4 ( $\pm$ 0.6)	0.2 ( $\pm$ 0.4)
	7 May 2002	1.1 ( $\pm$ 0.8)	0.5 ( $\pm$ 0.6)	0.2 ( $\pm$ 0.4)
	5 Apr 2002	1.5 ( $\pm$ 0.9)	0.6 ( $\pm$ 0.7)	0.3 ( $\pm$ 0.4)
	6 Mar 2002	1.7 ( $\pm$ 0.9)	0.7 ( $\pm$ 0.7)	0.4 ( $\pm$ 0.4)
	6 Feb 2002	2.0 ( $\pm$ 0.9)	0.8 ( $\pm$ 0.7)	0.4 ( $\pm$ 0.4)
	10 Jan 2002	1.9 ( $\pm$ 0.9)	0.8 ( $\pm$ 0.7)	0.4 ( $\pm$ 0.4)
	3 Dec 2001	1.9 ( $\pm$ 1.0)	0.8 ( $\pm$ 0.7)	0.4 ( $\pm$ 0.4)