



# April Forecast Update for Atlantic Hurricane Activity in 2002

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## Forecast Summary

**TSR further reduces its earlier forecasts and anticipates the 2002 Atlantic hurricane season and strikes on the USA and Caribbean Lesser Antilles being ‘near average’. Numbers are expected to be below the 10 year climate norm but above the 30 year norm.**

The TSR (Tropical Storm Risk) early April forecast update for Atlantic hurricane activity in 2002 anticipates an average hurricane season. 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 March 2002. The reason for predicting average hurricane activity is our expectation, for August-September 2002, of slightly positive ENSO conditions (suppressing effect), slightly above average tropical Atlantic sea surface temperatures (weak enhancing factor), and average trade winds over the Caribbean Sea and tropical north Atlantic (neutral effect). Our projections have fallen from last month due to shifts in each predictor favouring decreased hurricane activity. Appendices show our predictions from previous months.

### Atlantic Total Numbers in 2002

		Intense Hurricanes	Hurricanes	Tropical Storms
TSR Forecast ( $\pm$ FE)	2002	2.4( $\pm$ 1.9)	6.3 ( $\pm$ 2.3)	11.2 ( $\pm$ 3.1)
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	11%	9%	15%

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

		Intense Hurricanes	Hurricanes	Tropical Storms
TSR Forecast ( $\pm$ FE)	2002	2.4( $\pm$ 1.8)	4.5 ( $\pm$ 2.3)	8.0 ( $\pm$ 3.2)
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	11%	13%	15%

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	1.4 ( $\pm$ 1.1)	3.0 ( $\pm$ 1.6)
Average ( $\pm$ SD)	1992-2001	1.2 ( $\pm$ 1.2)	3.3 ( $\pm$ 1.8)
Average ( $\pm$ SD)	1972-2001	1.2 ( $\pm$ 1.3)	2.6 ( $\pm$ 1.8)
Forecast Skill at this Lead	1987-2001	10%	16%

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	0.3 ( $\pm$ 0.4)	0.6 ( $\pm$ 0.7)	1.5 ( $\pm$ 0.9)
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	7%	8%	4%

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 an average hurricane season in 2002 are the anticipated near-neutral effects of 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 of August-September forecast SST for the Atlantic MDR. The current forecast anomalies (1972-2001 climatology) and forecast skill for these two predictors at this lead are  $0.17 \pm 0.75 \text{ ms}^{-1}$  (18% skill) and  $0.16 \pm 0.24 \text{ }^\circ\text{C}$  (18% skill) respectively.

## 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 7th May 2002. Further regular monthly updates will follow through to early 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)	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 Forecast	07 Dec 2001	13	8	4

### 2. MDR, Caribbean and Gulf of Mexico Total Numbers (Tropical North Atlantic)

<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)	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)	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)	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)