

## Experimental Long-range seasonal forecast

### U.S. Landfalling Tropical cyclones 1999

Issued: 1st December, 1998  
backdated to 1st October, 1998.

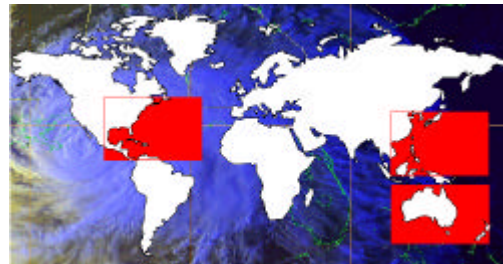
**Not for public circulation before 01/01/99**

## The TSUNAMI Initiative

TSUNAMI aims to improve the competitiveness of the UK insurance industry by using the UK science effort to improve the assessment of risk. TSUNAMI is funded by a consortium of companies from the UK insurance industry and the Treasury. Government funding is through the DTI's Sector Challenge and administered by the British Antarctic Survey, a component body of the Natural Environmental Research Council.

## Seasonal prediction of tropical cyclones

This is a two year TSUNAMI project awarded to The Met.Office, University College London and Reading University.



The project will establish a new methodology for the long-range landfalling seasonal prediction of tropical cyclones in three ocean basins. These forecasts will offer improved lead-time and skill level over that currently available.

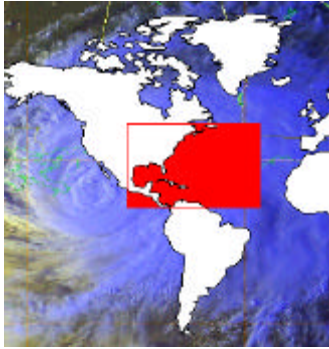
Statistical methods are used to identify predictors for landfalling events. The predictions used in the forecast are a mix of current climate parameters and dynamical and statistical model predictions of climate parameters for the coming tropical cyclone season. This paper outlines preliminary predictions for the North Atlantic Basin.

## Project Team

This first forecast is produced by Dr Mark Saunders and Dr Chris Merchant of the Benfield Greig Hazard Research Centre, University College London. The project is managed by Mrs Alyson Bedford of The Met. Office

TSUNAMI would also like to thank the insurance industry representative; Lance Garrard of Sedgwick Re, Dr Mike Davey, of the Hadley Centre for Climate Prediction & Research and Dr Richard Chandler of the Department of Statistical Science, University College London.





**Key for tables and graphs:**

**Sustained Wind**

TS	Tropical Storms	34-63 Kts
1&2	Hurricanes, Category 1 & 2 only	64-95 Kts
H	All Hurricanes	>63 Kts
IH	All Intense Hurricanes, Category 3-5	>95 Kts
TC	Tropical Cyclones (TS + H)	
Average	Refers to the 1979-1998 period	

**Summary**

From the information available by September 1998 we forecast the following for landfalling tropical cyclones in the U.S. during 1999:

- Landfalling activity
  - Well above the 20-year average, although less active than 1998
- The number of tropical cyclones originating from the:
  - Tropical and extratropical North Atlantic will be above average.
  - Caribbean will be less than average
- The chance of at least one intense hurricane strike to be
  - 40% ( $\pm 25\%$ ) above average.
  - 70% ( $\pm 35\%$ ) above average for the East Coast
  - 35% ( $\pm 30\%$ ) above average for the Gulf Coast
- Comparison

The number of tropical cyclones hitting the U.S. mainland in 1998 was the third highest on record since 1871.

			<b>IH</b>	<b>H</b>	<b>TC</b>
Average	1979-1998	Total 3 :	0.5	1.5	3.0
Actual	1998	Total 7 :	1	3	7
Forecast	1999	Total 4 :	1 ( $\pm 1$ )	2 ( $\pm 1$ )	4 ( $\pm 2$ )

The activity in 1999 is predicted to be higher than normal, but lower than 1998. This is largely due to mild La Nina conditions, coupled with mid-Atlantic sea surface temperatures at average levels, anticipated in 1999.

*A further forecast will be published in June 1999.*

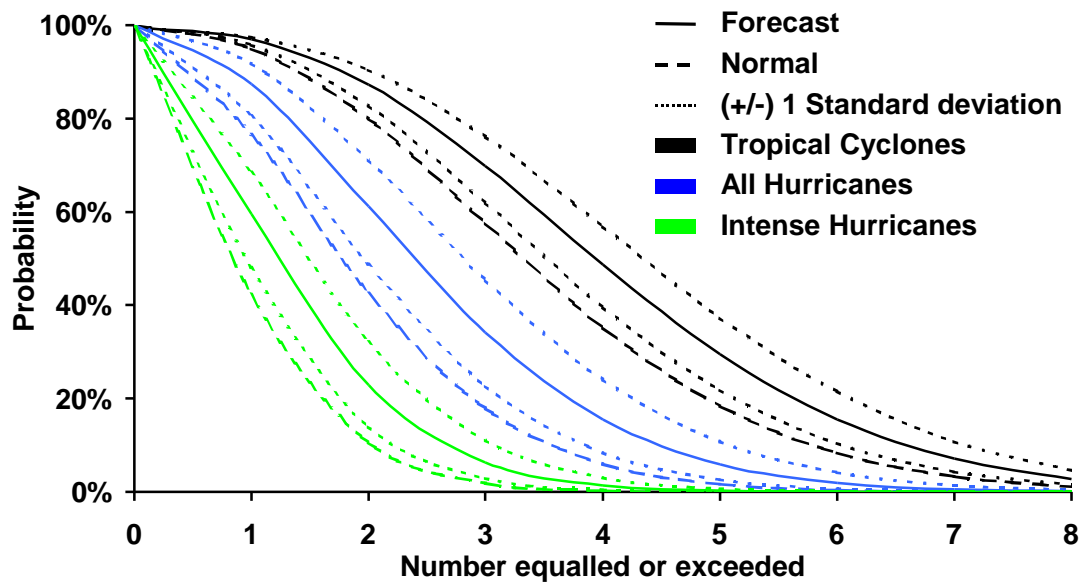
*A detailed report on the methodology used can be obtained from the TSUNAMI website:  
<http://www.nerc-bas.ac.uk/public/tsunami/>*

## U.S.A. Landfalling tropical cyclones

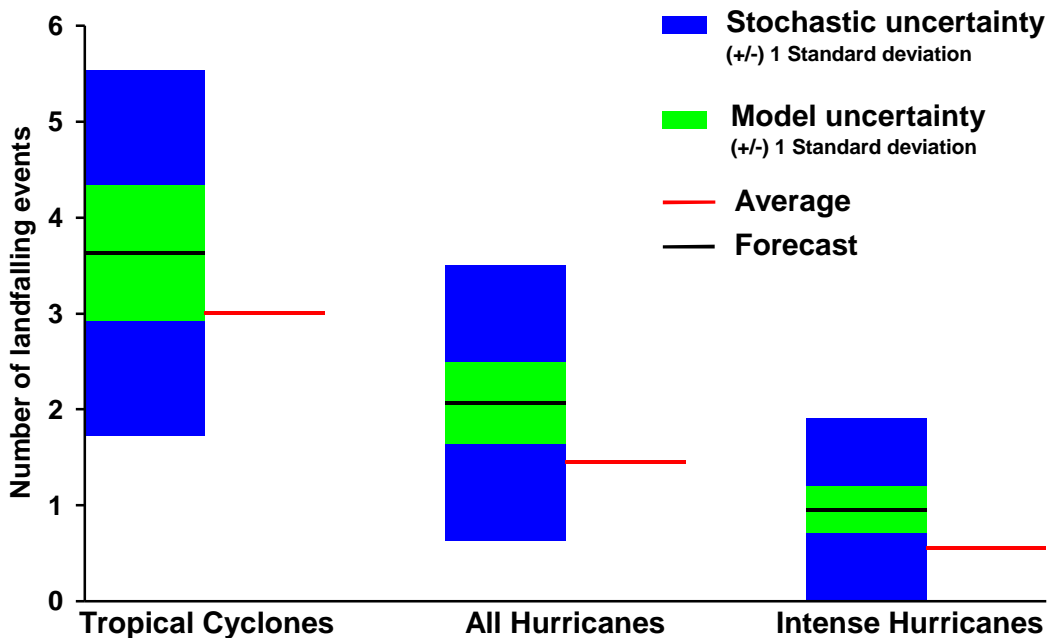


No. of events	Probability of N events (mutually exclusive)							
	Forecast				Normal			
	TC	TS	1&2	IH	TC	TS	1&2	IH
0	3%	20%	31%	41%	5%	21%	41%	58%
1	10%	32%	36%	37%	15%	33%	37%	32%
2	17%	26%	21%	16%	22%	26%	17%	9%
3	21%	14%	8%	5%	22%	13%	5%	1%
4	19%	5%	2%	1%	17%	5%	1%	0%
5	14%	2%	1%	0%	10%	2%	0%	0%
6	8%	0%	0%	0%	5%	0%	0%	0%

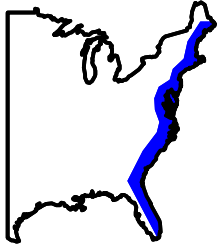
## Cumulative probability of landfalling events



## Frequency & severity distribution

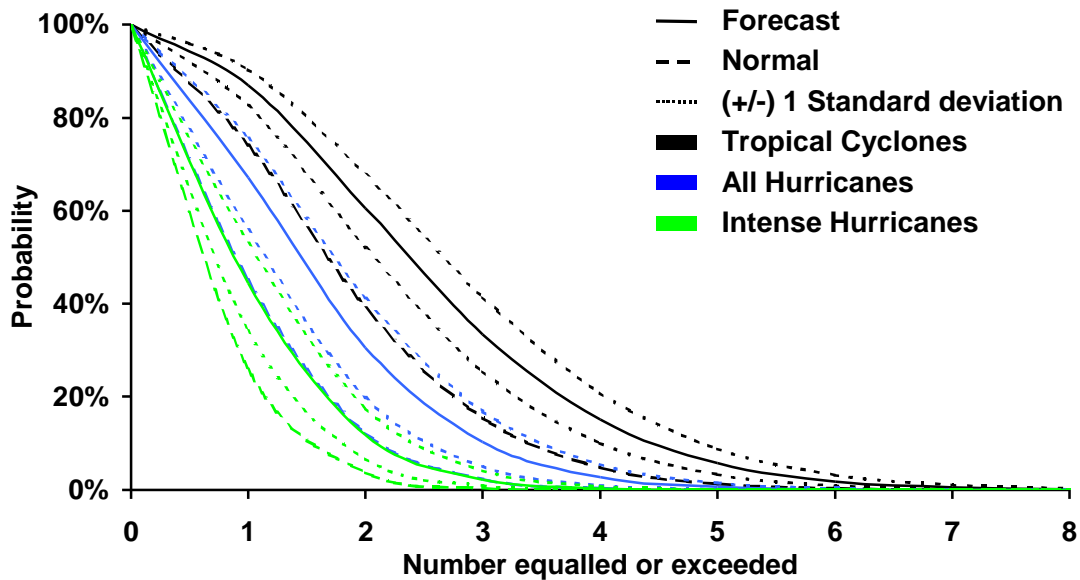


## East Coast Landfalling tropical cyclones

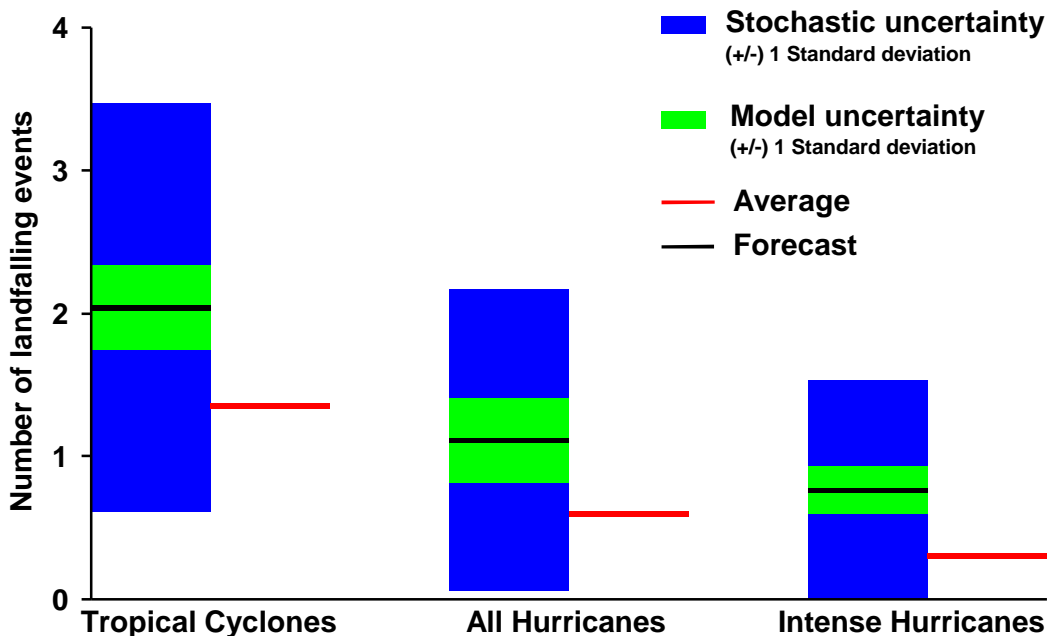


No. of events	Probability of N events (mutually exclusive)							
	Forecast				Normal			
	TC	TS	1&2	IH	TC	TS	1&2	IH
0	13%	39%	59%	56%	26%	47%	74%	74%
1	26%	37%	31%	33%	35%	35%	22%	22%
2	27%	18%	8%	10%	24%	13%	3%	3%
3	19%	6%	1%	2%	11%	3%	0%	0%
4	10%	1%	0%	0%	4%	1%	0%	0%
5	4%	0%	1%	0%	1%	0%	0%	0%
6	1%	0%	0%	0%	0%	0%	0%	0%

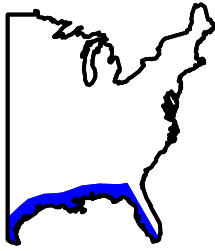
## Cumulative probability of landfalling events



## Frequency & severity distribution

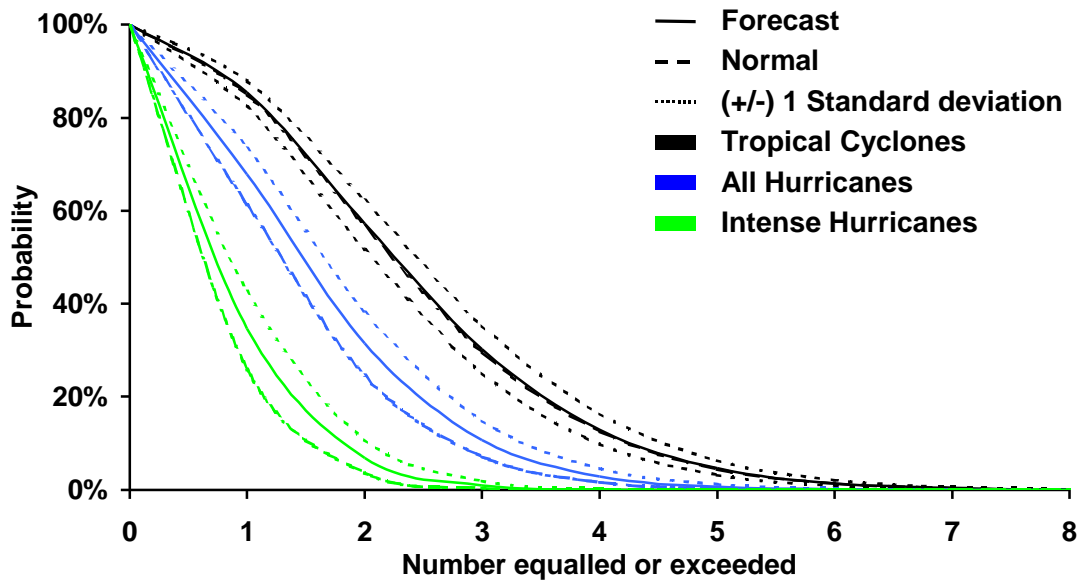


# Gulf Coast Landfalling tropical cyclones



No. of events	Probability of N events (mutually exclusive)							
	Forecast				Normal			
	TC	TS	1&2	IH	TC	TS	1&2	IH
0	15%	46%	49%	66%	15%	39%	52%	74%
1	28%	36%	35%	28%	28%	37%	34%	22%
2	27%	14%	12%	6%	27%	18%	11%	3%
3	17%	4%	3%	1%	17%	6%	2%	0%
4	8%	1%	1%	0%	8%	1%	0%	0%
5	3%	0%	1%	0%	3%	0%	0%	0%
6	1%	0%	0%	0%	1%	0%	0%	0%

## Cumulative probability of landfalling events



## Frequency & severity distribution

