Breakthrough in forecasting US hurricane activity by UCL scientists

The strength of hurricane activity striking the United States during the main hurricane season can now be predicted with significant accuracy thanks to a new computer model developed by scientists at University College London (UCL). The model, unveiled in a paper in the 21 April issue of the journal *Nature*, will enable government, public, emergency planning bodies and insurers with US interests to receive warning in early August of the likelihood of either high or low hurricane damage during the subsequent main hurricane season from August to October. This scientific breakthrough offers the potential to significantly reduce the financial risk and uncertainty associated with each hurricane season.

The model, developed by Dr Mark Saunders and Dr Adam Lea of the UCL-based Benfield Hazard Research Centre and Tropical Storm Risk forecasting venture, uses anomalies in wind patterns from six regions over North America and the east Pacific and North Atlantic oceans during July to predict the wind energy of US striking hurricanes for the main hurricane season. The July wind anomalies are from heights between 750 and 7,500 metres above sea level and exhibit a consistent and significant link to the energy of US landfalling hurricanes during the subsequent hurricane season. The wind anomalies in these regions are indicative of atmospheric circulation patterns that either favour or hinder evolving hurricanes from reaching US shores.

The large year-on-year variability in the number of hurricanes making US landfall means that skilful seasonal forecasts of activity would benefit both individuals and a range of decision-makers. Hurricanes afflict Florida, the eastern seaboard and the Gulf Coast. They rank as the US's most expensive natural disaster and are responsible for eight of the 10 most costly catastrophes to have affected the country. The annual average damage bill from hurricane strikes on the continental US between 1950 and 2004 is estimated at $5.6 billion (at 2004 prices).

The model correctly anticipated whether US hurricane losses were above-median or below-median in 74% of the years between 1950 and 2003. It also performed well in 'real-time' operation in 2004, predicting US landfalling hurricane wind energy in the upper quartile for this active and damaging hurricane season. Insurers and others would have reduced their losses in 2004 by acting upon the forecast.

"For over two decades scientists have been attempting - with limited success - to deliver seasonal predictions of hurricane activity reaching the coast of the United States," said Dr Saunders. "This study is the first to offer forecast precision which is high enough to be practically useful. Our use of height-averaged winds as a predictor is innovative for seasonal weather forecasting and may benefit the seasonal prediction of tropical storm

landfalls elsewhere in the world. All those with an interest may access our forecast for the 2005 US hurricane season from www.tropicalstormrisk.com on the 4th August."

Notes for Editors

1. *Seasonal prediction of hurricane activity reaching the coast of the United States*, by Dr Mark A. Saunders and Dr Adam S. Lea, appears in the 21 April issue of the journal *Nature*.

2. This work is supported by the TSR (Tropical Storm Risk) venture sponsored by Benfield (an independent reinsurance intermediary), Royal & Sun Alliance (an insurance group), and Crawford & Company (a claims management solutions company).

3. For images, interviews and filming requests, please contact Dominique Fourniol in the UCL Media Relations Office, 0044 (0)207 679 9728, d.fourniol@ucl.ac.uk.

About UCL

Founded in 1826, UCL is the Sunday Times University of the Year 2004 and the fourth-ranked UK university in the top 500 world universities for 2004 league table produced by the Shanghai Jiao Tong University. In the government's most recent Research Assessment Exercise, 59 UCL departments achieved top ratings of 5* and 5, indicating research quality of international excellence.

UCL's centres of excellence include: Slade School of Fine Art; Bartlett School of Architecture; Benfield Hazard Research Centre; Institute of Child Health; Institute of Ophthalmology (Moorfields); Institute of Neurology; Royal Free and University College Medical School.

UCL was the first English university established after Oxford and Cambridge, the first to admit students regardless of race, class, religion or gender, and the first to provide systematic teaching of law, architecture and medicine. UCL alumni include Mahatma Gandhi, Chaim Herzog, Junichiro Koizumi, Lord Woolf and members of the band Coldplay.

<u>About Benfield Hazard Research Centre</u>

With over forty researchers and practitioners, the Benfield Hazard Research Centre (BHRC) at UCL is Europe's leading multidisciplinary academic hazard research centre (www.benfieldhrc.org). The BHRC is sponsored by Benfield, the independent reinsurance intermediary and risk advisory business. Benfield's customers include many of the world's major insurance and reinsurance companies as well as government entities and global corporations.

About Tropical Storm Risk (TSR)

Founded in 2000, Tropical Storm Risk (TSR) offers a leading resource for forecasting the risk from tropical storms worldwide. The venture provides innovative forecast products to benefit risk awareness and decision making in (re)insurance, other business sectors, government and society. The TSR consortium is co-sponsored by Benfield, the leading independent reinsurance intermediary; Royal & Sun Alliance, the global insurance group; and Crawford & Company, a global claims management solutions company. The TSR scientific grouping brings together climate physicists, meteorologists and statisticians at University College London and the Met Office. www.tropicalstormrisk.com

In 2004 Tropical Storm Risk won the prestigious British Insurance Award for London Market Innovation of the Year. TSR has recently introduced tropical storm alert feeds to Reuters AlertNet (www.alertnet.org), the humanitarian news portal, and to the United Nations World Food Programme (www.hewsweb.org).