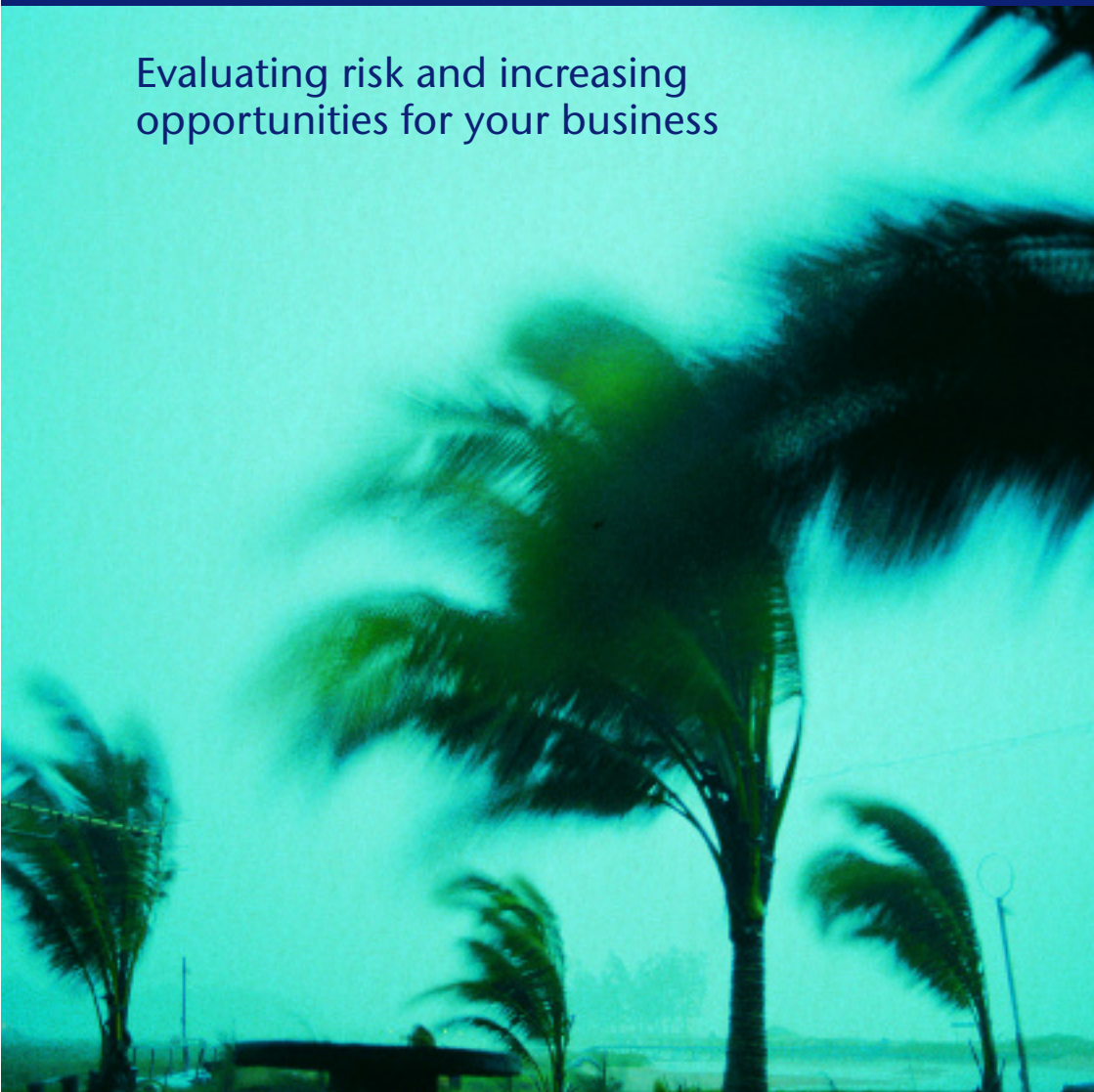


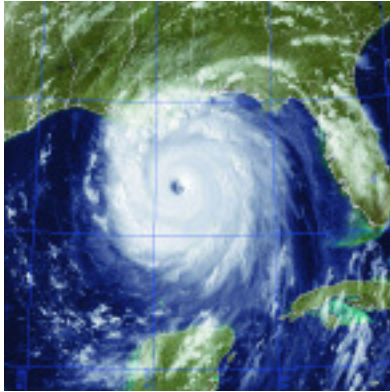
Met Office Consulting



Tropical storms and hurricane prediction

Evaluating risk and increasing
opportunities for your business





Key messages:

- There is a new way of forecasting hurricanes on seasonal timescales – climate models are now being used to predict tropical storm numbers months ahead.
- Met Office risk based forecasts have been shown to be more accurate than traditional methods providing good advice in both 2005 and 2006.
- The Met Office is a world leader in climate prediction on all timescales and is the centre for global forecasting excellence in Britain.

Tropical storms are not high on the agenda of most people in the UK, but to the City they represent a significant risk. In 2005, Lloyds estimated its losses to be £2.9 billion as a result of the three biggest hurricanes in the Atlantic season alone. The impact of Hurricane Katrina on oil and gas production was hugely significant for global markets.

The UK's Public Weather Service is supporting a basic tropical storm frequency forecast for the Atlantic's June-November season. Our ability to provide these forecasts with unparalleled accuracy came out of world-leading global seasonal forecasting research in close collaboration with European Centre for Medium Range Weather Forecasting (ECMWF) and Météo-France and our own climate change research at the Met Office Hadley Centre.



New developments

The Met Office's short-range weather model gives some of the best advice on hurricane track and landfall. It forecast the landfall of Katrina 12 hours ahead of any other model and track errors have decreased year on year.

Longer range forecasts of tropical storms and hurricanes have traditionally been based on historical analysis; looking at ocean temperatures and past years that had similar conditions to now and then combining these with subjective human judgement. The Met Office has a 20 year world-leading track record in developing and issuing statistical forecasts for everything from cold European winters to West African droughts and understanding many aspects of our natural climate variability.

On top of all this, we now have a new technology. Climate models use our short-range weather forecasting models and embody the laws of physics. They are started from a global nowcast of the whole earth system and are being used to estimate both the natural and future climate changes caused by human activities.

The complete earth system is forecast many times into the future using some of the world's biggest supercomputers. While this is a burgeoning technology, the climate models have been shown to have world-leading skill in objectively forecasting global phenomena such as El Niño and tropical storm numbers.

"It's an indisputable fact that global warming is having an impact. We need to better plan and prepare for catastrophe loss."

Lloyd's Chairman Peter Levene

How it's done

Once a month, our climate model is initialised with a full earth-system estimate of the here and now. To assess the risks of future events, the climate model is run 41 times six months into the future sampling the known uncertainties in the system. These forecasts are calibrated using historical forecasts to adjust for model biases and produce risk based forecasts of all future events.

Risk management

To manage your corporate and investment risks you need the best information available. Probabilistic climate forecasting technology is the cutting edge – the Met Office is the world expert in the use of risk-based weather and climate forecasts from minutes to decades ahead.

In 2005, these forecasts were assessed to give 11% chance of 27 storms or more in the Atlantic. That is triple the normal chance of a very extreme season and our forecasts have proven to be more accurate than traditional techniques (Vitart et al. 2007). The potential is huge – allowing your risks to be optimised against your own market exposure – not just to tropical storms, but for the many different climate events that impact your business.

Future potential

This is an exciting beginning. Climate models have never been targeted at hurricanes before because it was thought that they could not represent them. Now we know better, our portfolio of hurricane products will be developed to fulfil your business needs. We will also assess the ability of climate models to forecast the full range of hurricane impacts across all timescales from intra-seasonal forecasts out to decades ahead.

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