How did you become a hurricane predictor?
My original background was in space plasma physics [the study of how magnetic fields of charged particles interact in space to create phenomena like aurora and magnetic storms on Earth]. It is pretty pure research that looks at what is going on in outer space. But I changed to climate physics eight years ago to do work that I thought was more practical and of more benefit to humankind.

I started looking at sea surface temperature from space. That was at the time of the very active hurricane season in 1995, so I began to look if anything unusual was happening. I noticed that sea temperatures in the Atlantic were at near-record levels and realised that there must be a connection. My interest in hurricanes really took off from there.

Later, we had a paper published that featured in a front-page story in the New York Times. I got so interested in the subject that I set up a team looking into long-range forecasting of hurricanes and other weather extremes.

What does your average day entail?
My days are pretty varied. My top priority is the smooth running of my research group. I try to have daily meetings with members of my team, to discuss their research progress, new ideas and to ensure that forecasts are produced on time.

Another large part of my day involves keeping income flowing in. That includes writing lots of grant proposals.

Thirdly, I write lots of scientific papers and give presentations. After all, if you don’t tell people what you’re doing there’s not a lot of point doing it.

Finally, being based at University College London means I have a pretty full teaching schedule.

“I believe that global warming is occurring. It seems likely that the number of Atlantic hurricanes will increase if tropical waters do warm to the level that climate models are predicting”

Are insurers the biggest donor to the climate prediction industry?
They are at the moment. Certainly my own group gets over half its funding from the insurance industry. Increasingly, climate groups in this country and abroad appreciate that extreme weather impacts insurance so much that there is plenty of scope for collaboration with the industry. I think there is tremendous potential for growth in this area too.

Is it not strange that the industry sponsors initiatives like yours, but takes very little notice of its findings in its pricing?
I would tend to agree. But we are working hard to try to overturn that view. Attitudes take time to change and I think that our forecasts are having an effect, by raising skills standards and by clearly defining what the uncertainties in any forecast are. It takes several years for people to have confidence in forecasts, but I believe that, within a few years, forecasts will have an impact on pricing.

Perhaps not the long-range forecasts, which look six to nine
months into the future, but those which are done as the hurricane season approaches. The skill in forecasts for two to four months out increases, which gives companies the opportunity to buy extra reinsurance as the season nears.

Are you looking to serve other industries as well as insurance?
Yes we definitely are. Surveys show that 70%-80% of industry is affected by the weather, particularly the energy, agricultural, food and retail industries. We are actively pursuing these opportunities with other industries, but insurance has really taken the lead.

What has been the biggest achievement of your career to date?
What I am proudest of is setting up a research group into long-range weather patterns. Linked to that is my belief that we are making predictions that are setting new skills standards and making the uncertainties within those predictions more transparent.

What has been your biggest disappointment?
Perhaps my biggest regret – rather than disappointment – is not switching earlier to climate physics. Working on climate has more practical benefits; it is also more enjoyable because I feel I’m doing something really useful.

The other slight regret is that pay levels working in the university sector are not higher. It would help me to attract and retain the best talent to work in this area.

Has there been a brain drain in climate physics?
One is starting. A few months ago, I lost one of my best researchers to a multinational energy company. He lost one of my best researchers to a multinational energy company. He

How do the various methods for forecasting hurricanes differ?
The two main methods for long-range forecasting are statistical and what is known as dynamical. The statistical method is based on predicting storm activity from the number and force of hurricanes and other climate parameters that have occurred in the past. Whereas the dynamical methods try to model the whole climate using the basic equations of physics to predict storms.

Most of the long-range forecasts to date have used statistical methods. Bill Gray and James Elsner at Florida State University use these methods. We at TSR [Tropical Storm Risk, a joint venture between CGNU, Royal & SunAlliance, Benfield Greig, University College London and the UK Meteorological Office] will introduce dynamical methods into our forecasting later this year. These methods are viable for forecasts out as far as four months so it seems that statistical methods are the only way of doing hurricane forecasts beyond that at this moment. Ours will be the first study to judge whether dynamical methods build on the statistical method. If they do, that will be of interest to many people. We will know the answer later this year.

How have hurricane predictions developed over the past five years?
Bill Gray [hurricane predictor at the University of Colorado] has set the standard in predicting Atlantic hurricanes for a decade or more. There have been clear advances from the sun. Whereas the other climate parameters that have occurred in the past. Whereas the dynamical methods try to model the whole climate using the basic equations of physics to predict storms.

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How accurate are your predictions?
Over the past 15 years, we offer skills levels for Atlantic forecasts made in early June that are 20%-30% better than climatology forecasts, which are forecasts based on the long-term average conditions. For storms and hurricanes actually making landfall on the US mainland we offer skills levels that are 10%-20% better than climatology predictions. By the time the main hurricane season begins in August those skills levels would have gone up by 50%. So there are real predicting skills there.

Elsner has recently predicted that up to 11 hurricanes – which could devastate parts of South Florida, North Carolina or Texas – will hit the US in 2005. Do you agree?
I know he has been involved in predictions relating to weather patterns over decades, but I must admit that I’m not entirely convinced by his methods. It is a new area, but I can’t see how anyone can predict with any confidence that a big one will happen in five years’ time.

It is true we are going through a very active phase in the Atlantic at this time, so the numbers of hurricanes are likely to keep increasing because global warming is increasing the temperature of the Atlantic. But I don’t think one can predict a truly catastrophic hurricane in five years’ time. That really depends where the hurricane makes landfall – something one cannot predict until a few hours beforehand.

Do you believe that the climate is changing due to pollution?
Yes, I believe that global warming is occurring. The 1990s were the warmest decade in the last millennium, which I feel is almost certainly due to human actions rather than a changing output from the sun.

One of the members of my team is actually studying the impact of global warming on the number of hurricanes. It seems likely that the number of Atlantic hurricanes will increase during the next century if tropical waters do warm to the level that climate models are predicting.