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A risk proposition

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Hedge against catastrophe

Graciela Chichilnisky is a mathematician and an economist at Columbia University. She is also director of the Program on Information and Resources' Risk Center at the Columbia Earth Institute. Her interest in risk began in the early 1990s when she saw how catastrophic events such as hurricane Andrew had shaken up the insurance industry. Knowing that hurricane frequency is related to the El Niño Southern Oscillation (ENSO) and with her knowledge of chaotic, dynamical systems, Chichilnisky began to assess the risks from natural geophysical events, developing a theory of how these risks could be classified. She designed financial instruments that could effectively hedge against catastrophic events, which by their nature cannot be predicted. One result of her work is an instrument that she calls Catastrophe Bundles, a portion of which, the El Niño Index, is being commercialized by the Bermuda Stock Exchange in cooperation with Columbia University.

Chichilnisky's Risk Center operates in the grey area between publicly supported academic research and private interests, and allows the group's intellectual property to be commercialized. According to Chichilnisky, this set-up should provide better financial cover for the insurance industry, which may allow more companies to offer hurricane insurance at lower rates.

Some reinsurers, notably Swiss Re and

Munich Re, have built substantial in-house research groups that include scientists hired from academia. "I'm astonished to find myself working for a reinsurance company," says Jürg Trüb, head of the Atmospheric Perils Group at Swiss Re. "However, I quickly learned that the insurance industry and, in particular, reinsurers need highly specialized geoscientists to analyse the risks of natural catastrophes."

About one-third of his group's work is in research and development. "Our work is more 'purpose-orientated' and less in-depth research," he says. The group adapts and interprets the latest results in geoscience for the insurance industry. It must examine how weather forecasting and ENSO could affect underwriting, identify natural catastrophes that the company and its clients may be exposed to, and assess whether the group thoroughly understands and can manage these risks.

Further reading on climate risk, insurance and finance

A Calculus of Risk	http://www.scientificamerican.com/1998/0598issue/0598stbx.html
Christopher Barton at USGS	http://coastal.er.usgs.gov/hurricane_forecast/barton2.html
The Risk Prediction Initiative, Bermuda Biological Station	http://www.bbsr.edu/agc/home/rpi/rpihome.html
Columbia's Program on Information Resources	http://www.earthinstitute.columbia.edu/units_partnerships/pir/index.html
The USC Wrigley Institute for Environmental Studies	http://wrigley.usc.edu/buss.shtml
US National Assessment	http://www.nacc.usgcrp.gov/
Munich Reinsurance	http://www.munichre.com/
Swiss Reinsurance Company	http://www.swissre.com/