

Could humans tackle hurricanes?

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10:58 14 September 2005

[NewScientist.com news service](#)

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Tackling hurricanes before they make landfall by calming them down or steering them off course may be a good way to prevent a storm striking a city. Experts are working on numerous ways to do this but it may take some time – and it has never been done before.

Hurricanes are fuelled by the warm waters they pass over. So hurricane mitigation strategies all focus on depriving hurricanes of this fuel.

In April 2005, Moshe Alamaro at the Massachusetts Institute of Technology, US, outlined a plan to use an array of floating jet engines to trigger miniature cyclones in the atmosphere ahead of a hurricane. The idea is to drain the ocean and atmosphere of energy before the hurricane arrives. But critics point out that even a large array of jet engines probably cannot inject enough energy into the atmosphere to trigger even a tiny storm.

Another strategy is to cover the ocean ahead of the hurricane with a thin layer of [fish oil](#) that disrupts the flow of energy into the atmosphere. But experiments in 2002 by Kerry Emanuel, a hurricane expert also at MIT, suggest that high winds would break up the oil layer and prevent it from having an effect.

Then there is the idea of triggering storms with soot – which would provide a nucleus for moisture in a cloud to form. In 1973, William Gray, a hurricane expert at Colorado State University in Fort Collins, suggested that the extra energy absorbed by soot could trigger smaller storms. In 1958, the US Naval Research Laboratory carried out a series of experiments to monitor clouds seeded with soot but the results were inconclusive. The idea was to seed clouds inside a hurricane and disrupt its inner structure and so weaken it.

Atmosphere of blame

Emanuel says the best idea may be to exploit the chaotic features of weather systems to steer them away from populated centres, an idea put forward by Ross Hoffman, a researcher at Atmospheric and Environmental Research, a research and development company based in Lexington, Massachusetts. The idea is based on the so-called butterfly effect – that a small nudge to a chaotic system such as a hurricane could end up having a big enough influence to knock it off course.

Meteorologists first need better hurricane measurements and models to forecast the effect of any “nudge”. They also need a way to do the nudging, possibly with space-based reflectors to heat up the atmosphere; something that Hoffman believes is a long way off.

But nudge a hurricane and the danger is that scientists may get blamed and sued wherever it goes, a problem that could mire hurricane mitigation attempts in numerous legal challenges. “You need to be able to show that you’re going to make things better,” says Hoffman.

Emanuel agrees and says that hurricane steering creates hard choices. “Choosing between a Category 3 hitting Pensacola and a Category 5 hitting New Orleans is easy. But the people of Pensacola may have something to say about it.”

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Weblinks

Moshe Alamaro, MIT

<http://alamaro.home.comcast.net/Alamaro-bio.htm>

Kerry Emanuel, MIT

<http://wind.mit.edu/~emanuel/home.html>

William Gray, Colorado State University

<http://typhoon.atmos.colostate.edu/>

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Printed on Mon Oct 17 17:37:12 BST 2005