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One Researcher's Plan: Fight Storms With Storms

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Moshe Alamaro has a modest proposal. Get a fleet of ocean barges and mount 10 or 20 jet engines -- tails up -- on each one. Fill the barges with aviation fuel and tow them into the path of an oncoming hurricane. Light off the jets.

If everything goes as planned, the jets will trigger small tropical storms, "like backfires," Alamaro says, marginally lowering the surface ocean temperature and depriving the real hurricane of energy as it gets closer to shore.

Less energy means less power, and less power can turn tigers like hurricanes Katrina and Rita into relative pussycats.

It is not clear how much support Alamaro has for his concept, which he defines as a "salient" that outdistances conventional thinking "by leaps and springs." But his zeal highlights the increased interest of scientists and laypeople alike in finding something -- anything -- to avoid another 2005.

A solution, unfortunately, does not loom on the horizon. Improved weather forecasting and the advent of satellite imagery have made the paths and dimensions of hurricanes much more predictable, but greater knowledge, while helpful, does not solve the problem. Hurricanes, as old boxers might say, are like fighting Sugar Ray Robinson: You know you're going to get hit, but there's still nothing you can do about it.

"I will go out on a limb and say, eventually, we will accomplish this," said Kerry Emanuel, an atmospheric scientist at the Massachusetts Institute of Technology. But by "this," Emanuel means "disaster avoidance, rather than weather control."

The trick is to introduce a "perturbation" in a hurricane -- a variation in moisture, wind speed, temperature or pressure -- so that the hurricane weakens or veers out to sea. The strategy uses the principle that a small, early change in a complex "chaotic" system such as a hurricane can have large, and benign, effects later on.

Alamaro's "free jet" plan is designed to create a temperature perturbation. He said he could test the concept -- in a remote part of the Pacific and in the hurricane off-season -- for about $10 million, by using junker jet engines from mothballed B-52s in Arizona.

"We have the jets and the barge, but we don't have knowledge about the effects and we don't have the knowledge about hurricanes," Alamaro said in a telephone interview. "A test would entice the necessary studies to make it feasible."

Perhaps. Alamaro, a research affiliate at the Harvard-MIT Division of Health Sciences & Technology, outlined his strategy at this year's annual meeting of the Weather Modification Association, amid "a lot of commotion."

This, in part, was because atmospheric scientists are skittish, Alamaro said: "They know that weather modification would give an unbelievable boost to atmospheric science, but they don't want to support it because of the stigma that it is some sort of black art."

This is true, said J. Greg Glenn, a civilian who studies weather modification at Florida's Eglin Air Force Base, and who is interested in enlisting Alamaro in a hurricane-mitigation project: "This isn't going to go away as junk science," he said. Glenn is not as interested in Alamaro's free jets as in an idea promoted by Emanuel: spraying a "monolayer film" on the ocean in front of a hurricane to inhibit the storm's ability to pick up heat energy and moisture from the sea surface.

And Emanuel, a top U.S. atmospheric scientist, is not an Alamaro fan: "I hate to sound pessimistic, but Moshe's strategy requires many orders of magnitude of energy more than what he's talking about, and the backfires would have to be almost as strong as the hurricane itself," Emanuel said. "I think, unfortunately, it falls into the category of nutty ideas."

Alamaro noted that in the 1970s the Soviet Union formed clouds on several occasions by using jet engines on land, a more difficult feat than in the tropical sea, and he dismissed Emanuel's criticism. "I say that Kerry Emanuel is not impressed by any idea but his own idea."

Regardless of the method, most atmospheric scientists would probably agree that manipulating hurricanes is not only an uncertain scientific undertaking but a potential catastrophe in several ways, if intended results are not achieved.

If scientists promise to save New Orleans and fail, they will be sued. Or if they hit Mississippi instead, they will be sued. If they promise to save New Orleans and hit Mexico, they will create an international incident. "Who takes the blame?" Emanuel asked. "It's a horrific political problem."

Hurricanes form in the eastern Atlantic as clusters of thunderstorms that pick up heat and moisture from surface water in the tropics. As the vapor rises, it cools and condenses into clouds and rain, releasing heat that causes the air to rise, repeating the cycle.

Air and moisture are drawn into the system in larger and larger volume, causing the storm to grow and begin to turn in sympathy with Earth's rotation and to move west, driven by trade winds. Alamaro seeks to duplicate this process on a mini-scale.

Modeling hurricanes "is a fine art," said Ross N. Hoffman, a principal scientist at the Lexington, Mass.-based firm Atmospheric and Environmental Research Inc. "The models vary in complexity. For water, one model may describe only relative humidity, while

another may use hundreds of variables to describe all the different sizes of water and ice particles."

The key to successful modeling is to start a forecast with the most accurate data available, said Hoffman, who developed a method that constantly refines the opening benchmark in light of later information.

Modeling it, however, is not the same as doing it, and Hoffman offered no guidance on whether the future will be one of free jets, monolayer films, cloud seeding, spraying the atmosphere with soot to shield the sea surface from the sun's rays -- or something else.

But what Hoffman probably has shown, Emanuel said, is that it is better to perturb a hurricane earlier, when slight changes can be introduced relatively cheaply, rather than later, when change becomes impossible except at outrageous cost.

"The trouble is that there's a trade-off between energy and information," Emanuel said. "The further in advance you do it, the smaller the energy you need but the more unpredictable the effect."