



## HUNTING GODZILLA

During the research assault on El Niño, a Gulfstream-IV jet and an unmanned Global Hawk plane will survey atmospheric conditions in different parts of the Pacific, and researchers will release balloon-borne instruments from a ship and from the island of Kiritimati.

► air pressure and moisture from a height of 12–14 kilometres down to the ocean surface (see ‘Hunting Godzilla’).

In February, NASA’s unmanned Global Hawk aircraft will join the effort, prowling the eastern part of the Pacific in 4 flights lasting up to 24 hours each. At the same time, NOAA will launch instrument packages on weather balloons from Kiritimati, or Christmas Island, an atoll near the Equator in the heart of the region in which El Niño forms. And researchers will also release balloon-borne instruments from the NOAA research ship *Ronald H. Brown* as it conducts a previously planned cruise in the central Pacific.

## SEIZING THE MOMENT

The idea for the roughly US\$3-million campaign developed as the warming gathered strength last year; Dole and his colleagues realized that they had a rare opportunity to collect the first detailed atmospheric measurements of a monster El Niño. NOAA scrambled to pull the campaign together in a few months — rather than the usual two to three years that it usually takes to mount a major meteorological field project.

The agency had some resources to spare: thanks to the way El Niño alters conditions over the Atlantic, there were relatively few tropical storms there last year. That meant that NOAA did not use all of the flying time budgeted for the Gulfstream-IV hurricane hunter, which flies over storms to collect data useful for forecasters. The quiet hurricane season also meant that the Global Hawk did not make as many research flights in the Atlantic as planned last year.

“We’ve done this largely by reallocating,” says Dole. “We’re working within the existing budget and shifting everything around.”

Alexey Fedorov, a climate modeller at Yale University in New Haven, Connecticut, says that because extreme El Niño events are so rare, “it is important to use any opportunity to

gather as much data as possible”. Fedorov, who is not part of the campaign, says that researchers lack a full understanding of the way that strong El Niños evolve and alter global weather patterns.

The information gathered over the next few months could yield long-term dividends for El Niño researchers, says Dole. “If we do this well, it will impact our community for the next 10 or 20 years.”

But the project’s immediate goal is to help forecasters to understand how the unruly atmosphere will affect weather now. By gathering direct measurements from this data-poor zone, leaders of the NOAA campaign hope to improve weather forecasts and allow researchers to test weather models to better understand the source of errors in those models.

Data from the Global Hawk will also aid meteorologists tracking El Niño-spawned storms as they barrel down on the western

**“If we do this well, it will impact our community for the next 10 or 20 years.”**

United States, says Dole. Over the past few weeks, coastal California has been pummeled by such storms, and more are expected. As part of the El Niño

campaign, NOAA has installed a scanning X-band radar south of San Francisco Bay that will measure precipitation in approaching storms.

The agency will upload data from the field campaign to the World Meteorological Organization’s Global Telecommunications System, so that forecasters around the globe can access the observations. Peter Bauer, an atmospheric modeller at the European Centre for Medium-Range Weather Forecasts in Reading, UK, says that he plans to feed the data into model experiments with the aim of improving forecasts for Europe. The campaign, he says, “has potentially a very big impact”. ■

## RESEARCH INTEGRITY

# GM-crop papers spark probe

Work describing harm from genetically modified crops was cited in Italian Senate hearing.

BY ALISON ABBOTT

Papers that describe harmful effects to animals fed on genetically modified (GM) crops are under scrutiny for alleged data manipulation. The leaked findings of an ongoing investigation at the University of Naples in Italy suggest that images in the papers may have been intentionally altered.

The leader of the lab that carried out the work says that there is no substance to this claim.

The papers’ findings run counter to those of numerous safety tests carried out by food and drug agencies around the world, which indicate that there are no dangers associated with eating GM food. But the work has been widely cited on anti-GM websites — and results of the experiments that the papers describe were

referenced in an Italian Senate hearing last July on whether the country should allow cultivation of safety-approved GM crops.

“The case is very important also because these papers have been used politically in the debate on GM crops,” says Italian senator Elena Cattaneo, a neuroscientist at the University of Milan whose concerns about the work triggered the investigation.

Following the Senate hearing, Cattaneo took a closer look at three papers<sup>1-3</sup>, which all emerged from a research lab at the University of Naples, headed by veterinary scientist Federico Infascelli. They describe experiments on goat kids born to mothers fed on GM soya-bean meal, and conclude that fragments of the foreign gene in the soya bean can be transported across the gut and secreted in the milk, influencing the biology of the suckling kids.

Cattaneo noted what looked like problems in all three papers: sections of images of electrophoresis gels appeared to have been obliterated, and some of the images in different papers appeared to be identical but with captions describing different experiments.

She commissioned Enrico Bucci, head of biomedical-services firm BioDigitalValley in Aosta, Italy, to carry out a forensic analysis of the papers. The analysis suggested that the papers indeed contained manipulated and reused images. Cattaneo contacted the journals concerned in September last year, and in November she sent the analysis to the University of Naples. The university rector, Gaetano Manfredi, an engineer, launched the university investigation, which is nearly complete. He says that the university will probably announce any resulting actions by the end of February.

However, details of the confidential findings of the investigation committee — composed



GM soya bean has passed numerous safety tests.

of scientists in and outside of Naples — were leaked to the Italian press. Tommaso Russo, a molecular biologist at the University of Naples who is coordinating the investigation, told *Nature* that the committee has found that the papers contain intentional data manipulation.

But, according to the Italian newspaper *La Repubblica*, Infascelli said that there is no substance to these allegations, and that an expert that he consulted about the papers had ruled out the possibility of data manipulation.

Infascelli declined to discuss the case with *Nature* until the investigation is complete.

On 14 January, Bucci posted his analysis of the three papers, as well as of four more papers on GM feed that were co-authored by Infascelli, and of a PhD thesis from Infascelli's lab. The analysis claims evidence for image manipulation in all eight papers. Bucci has informed Manfredi and Infascelli of his findings.

Since Cattaneo sent her findings to the journals concerned, one of the three papers under investigation has been retracted. The paper<sup>2</sup>, published in *Food and Nutrition Sciences*, was withdrawn with a citation of “self-plagiarism”. The journal noted that the results were still valid and that the issues were down to “honest error”.

Plant geneticist Wayne Parrott at the University of Georgia in Athens has independent concerns about image manipulation in the three papers, and in another from Infascelli's lab that claims<sup>4</sup> a metabolic impact of GM food in rabbits, which is also mentioned in Bucci's analysis. He has notified the relevant journals.

The investigation at the University of Naples is the first to test formal rules on scientific misconduct that Manfredi introduced last July. ■

1. Tudisco, R. *et al. Animal* **4**, 1662–1671 (2010).
2. Mastellone, V. *et al. Food Nutr. Sci.* **4**, 50–54 (2013).
3. Tudisco, R. *et al. Small Rumin. Res.* **126**, 67–74 (2015).
4. Tudisco, R. *et al. Anim. Sci.* **82**, 193–199 (2006).