

## Terrawatch: how tropical islands feed algal blooms

Scientists uncover secrets of 30-mile 'slow-cooked' cluster in South Pacific Ocean



Algal blooms are a rapid increase in the population of algae in an aquatic system. Photograph: Auscape International/Alamy

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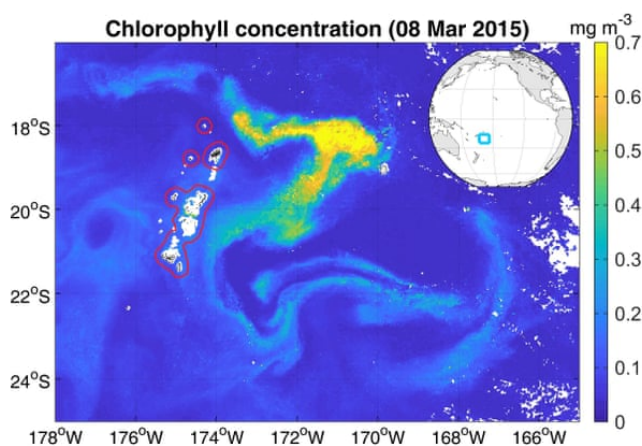
Tue 4 Feb 2020 21.30 GMT

In early 2015 a spectacular boomerang-shaped algal bloom, measuring more than 30 miles (50km) wide, blossomed in the western tropical South Pacific Ocean.

Scientists were instantly puzzled as to what was feeding the algae, given that the tropical Pacific is notoriously nutrient poor. Sometimes blooms like this are fed by currents that bring nutrient-rich water up from the deep, but ship measurements inside this bloom showed that was not the case here.

Instead the measurements revealed the presence of a slow-growing bacteria called *Trichodesmium*, which like to chomp through leftover phosphate and iron, and harvest nitrogen from the atmosphere.

By modelling the ocean currents in the area scientists have now shown that this bloom was most likely conceived near Tonga, about 250 miles away. The findings are published in *Geophysical Research Letters*.



Satellite image of the 2015 South Pacific algal bloom (yellow) and Tonga islands (red rings show nine-mile distance from shore). Illustration: Monique Messié, *Geophysical Research Letters*

Runoff after heavy rainfall on the archipelago pumped the iron and phosphorus into the water, but it was not until the bacteria had "fixed" enough nitrogen that the algae could really begin their feast.

In this case the bloom peak was more than a month after the rainfall event, by which time ocean currents had carried this tasty soup far from its source. Scientists now believe that these "slow-cooked" blooms may be much more common than we think.