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**Marine life**

## Ruth Gates obituary

**Marine biologist who pioneered research into the conservation of coral reefs**



Ruth Gates at an outdoor laboratory in Hawaii, where she was director of the Institute of Marine Biology. Photograph: Elyse Butler

**Barbara Brown**

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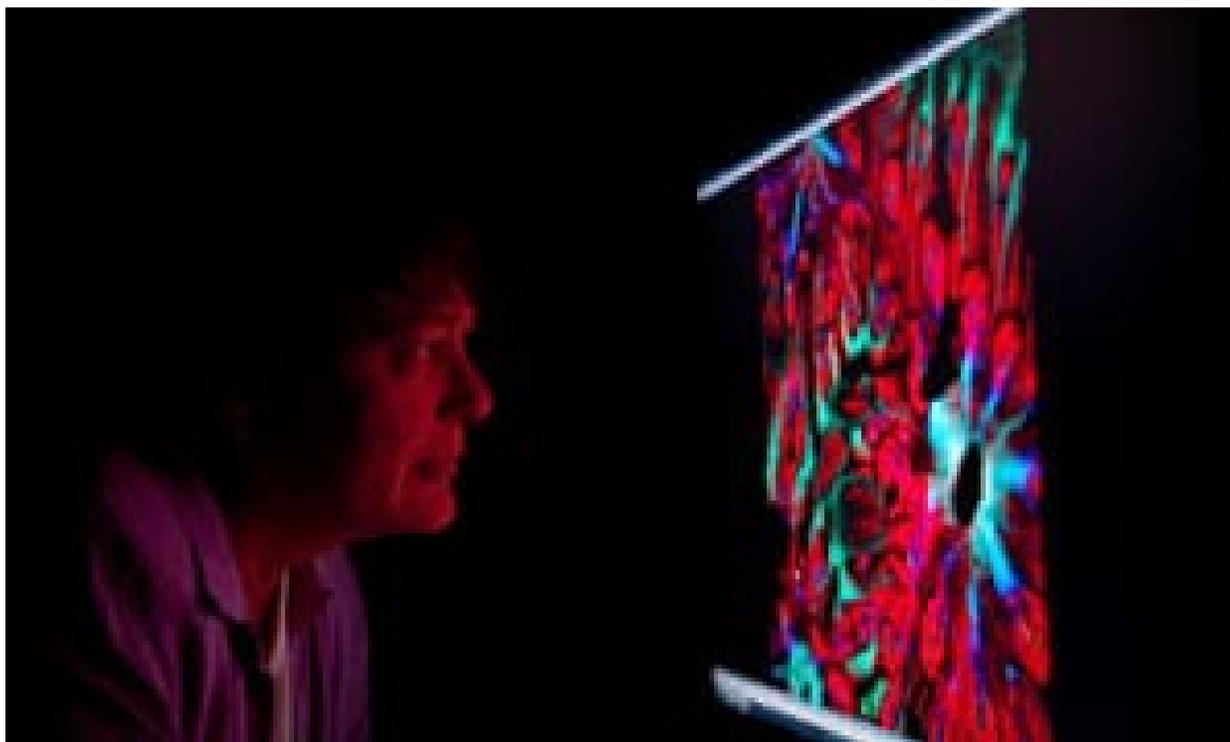
Ruth Gates, who has died aged 56 after suffering from complications following an operation, pioneered research into the breeding of “super corals” that are able to

withstand rising sea temperatures resulting from global warming.

Her work examined the traits that make some corals better survivors than others – with the aim of reinforcing those traits through selective breeding and then transplanting the more resilient corals on to damaged reefs. “I have watched some reefs disintegrate before my eyes,” she said in 2016. “I just cannot bear the idea that future generations may not experience a coral reef. The mission is to start solving the problem, not just to study it.”

Much of Ruth’s work was based at the Hawaii Institute of Marine Biology, where she had been director since 2015. Her experiments, conducted with Madeleine van Oppen of the Australian Institute of Marine Science, were intricate and very time-consuming, involving the collection of temperature-tolerant coral colonies from the field. Those individuals that did not bleach during natural bleaching events – when sea temperatures were high – then had their reproductive products collected in the laboratory after spawning. The offspring were raised and tested for improved temperature tolerance.

Research is now under way to establish the mechanisms involved in corals achieving such tolerance, and how it might be passed on to the next generation. That work will not only be continued by Van Oppen, but also in other laboratories around the world that have followed Ruth’s lead in this area, which has generated a large number of scientific papers and considerable global interest.



Ruth Gates looking at coral using a confocal microscope at the Hawaii Institute of Marine Biology on Coconut Island.

Photograph: Elyse Butler

Some scientists were, and remain, sceptical of the work, particularly over the costs that might be involved and whether it can be scaled up to be effective on an international level. However, Ruth robustly maintained that the dire state of many of the world's coral reefs makes it imperative that all possible solutions are explored.

Ruth was born in Akrotiri, Cyprus, where her father, John Gates, was stationed with the RAF. Her mother, Muriel (nee Peel), was a physiotherapist. After private schooling in England, and inspired by Jacques Cousteau, Ruth began an undergraduate course in marine biology at Newcastle University in 1984, graduating with a BSc before gaining a PhD there in 1990. Her postgraduate work allowed her to study coral reefs on the north shores of Jamaica, where she first observed the bleaching responses of corals to increased sea temperatures.

After her PhD she moved to the University of California, Los Angeles, for postdoctoral research into coral bleaching responses, remaining there for more than a decade as she built up research skills in cell and molecular biology and evolutionary genetics. In 2003 she was appointed as a research faculty member at the Hawaii Institute of Marine Biology on Coconut Island in Kaneohe Bay, subsequently leading a team at what was christened the Gates Coral Lab.

On the Film "Chasing Coral", With Ruth Gates, Coral Biologist, HIMB



Ruth Gates appearing in the Netflix documentary Chasing Coral

Ruth was a skilful trainer and mentor of her large laboratory of PhD and postgraduate students, many of whom have become internationally recognised

experts in their field. She also emerged as an effective and engaging public speaker and science communicator.

Audiences were captivated by her commitment to, and passion for, the science, and her optimism in the face of an increasingly dire future for coral reefs. In 2017 she appeared in the Emmy award-winning Netflix documentary *Chasing Coral*, and she was a regular commentator in the media, modestly attributing her success as a charismatic speaker to her boarding school English accent.

In 2015 she became the first woman to be elected president of the International Society for Reef Studies, helping to increase its membership during her tenure. An accomplished sub-aqua diver in her spare time, she also had a black belt in karate and helped to set up a karate school in Hawaii.

Ruth was diagnosed with brain cancer in May, but that condition was unrelated to the operation for diverticulitis after which she died.

She is survived by her wife, Robin Burton-Gates, whom she married this year, and her brother, Tim.

● Ruth Deborah Gates, reef scientist, born 28 March 1962; died 25 October 2018

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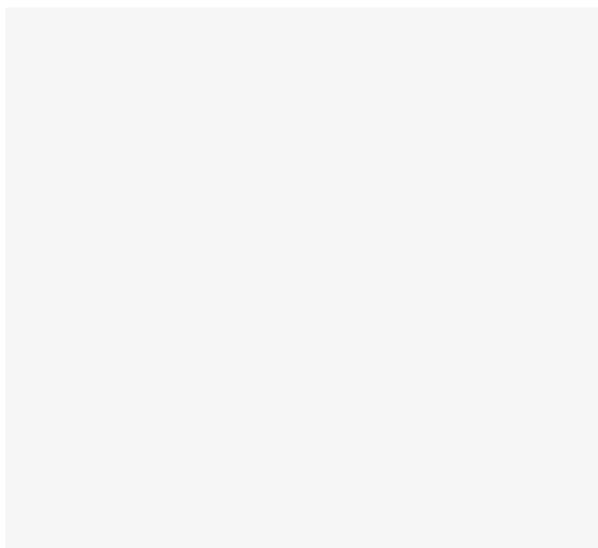
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