Scientists suspect groundwater polluted with excess nutrients from fertilizers contributed to past two decades. Corals in the Pacific Islands have been declining over the past several decades due to activities that have long-lasting impacts on coral reef communities and could be contributing to the problem. By Kathryn Cawdrey

Erler and this team investigated the decline of coral reefs in the Cook Islands, which are heavily cropped as demand for tropical produce was high. "Using reports and other records, we were able to piece together information on the discharge of this nitrogen to surrounding reefs," he said. "The important point is that the nitrogen inputs to tropical islands eventually leads to the discharge of this nitrogen to the surrounding reefs." Our results show that unregulated nitrogen inputs to tropical islands eventually leads to the discharge of this nitrogen to the surrounding reefs, Erler said.

To pinpoint where the excess nitrogen was coming from, the researchers compared the nitrogen usage in Rarotonga in 1986, at the end of the agricultural boom. In the height of the boom, agricultural fertilizer usage in Rarotonga was up to 10.7 tons—a 46-percent-nitrogen fertilizer—and 35 tons of fertilizer were used in Rarotonga. Original documents from the Cook Islands Department of Agriculture report up to 10.7 tons—a 46-percent-nitrogen fertilizer—and 35 tons of fertilizer were used in Rarotonga. In the height of the boom, agricultural fertilizer usage in Rarotonga was up to 10.7 tons—a 46-percent-nitrogen fertilizer—and 35 tons of fertilizer were used in Rarotonga.

Researchers suspect nitrogen continued to leach into coral reefs around the Cook Islands, Erler said. Tracing past nutrients, Erler and his team suspected deep groundwater on the Cook Islands still contained nitrogen. Erler and this team investigated the decline of coral reefs in the Cook Islands, which are heavily cropped as demand for tropical produce was high. "Going forward, our study shows that groundwater pollution today is a problem that will stretch far into the future," said Dirk Erler, a researcher at Southern Cross University's College of Science.

In the new study, the researchers analyzed nitrogen fingerprints preserved in long-lived coral colonies at two fringing reef sites around Rarotonga. The cores were sectioned into 7-millimeter- (0.3-inch-) thick slabs and X-rayed to determine age and growth characteristics. Scientists collected coral cores from Rarotonga in 1986, at the end of the agricultural boom. In the height of the boom, agricultural fertilizer usage in Rarotonga was up to 10.7 tons—a 46-percent-nitrogen fertilizer—and 35 tons of fertilizer were used in Rarotonga.

Reefs in Rarotonga stretch far into the future, Erler said. "Going forward, our study shows that groundwater pollution today is a problem that will stretch far into the future," said Dirk Erler, a researcher at Southern Cross University's College of Science.

Groundwater containing excess nitrogen from agricultural fertilizers likely contaminated South Pacific Ocean. By Kathryn Cawdrey

Scientists suspect groundwater polluted with excess nutrients from fertilizers contributed to past two decades. Corals in the Pacific Islands have been declining over the past several decades due to activities that have long-lasting impacts on coral reef communities and could be contributing to the problem.