

Rising sea level drowned island reefs years ago

□ The 25 coral banks lost in the past 18,000 years are called an accident of history

By Helen Altom
Star-Bulletin

HAWAII might have had more land above water if coral island reefs had been able to keep up with the rising sea level in the past 18,000 years.

Because of rising seas and erosion, however, 25 coral reefs in the Hawaiian chain wound up as drowned banks — great for fishing, if not people.

Why did some drown and others not? The puzzle is answered in a recent Science Magazine article by Richard "Rick" Grigg, University of Hawaii marine biologist, and David Epp, former UH geophysicist now with the National Science Foundation.

Discussing the paper in a recent interview, Grigg said drowned banks, found around the world, were an "accident of history," depending upon their depth.

They extend underwater from Penguin Bank off Molokai's western edge to Nero and Land Banks near Midway and Kure Island. The drowned banks range from 50 to 500 feet deep, Grigg said.

Grigg and Epp offer two explanations for the drowned banks:

■ Coral growth has been too slow to keep up with the rise in sea level the past 18,000 years.

This is a paradox, Grigg said, because coral reef ecologists traditionally have thought reefs could keep up with sea level rise.

"What was not understood is how fast the sea level did rise during the last 18,000 years of ice melting. It has been cranking along pretty fast."

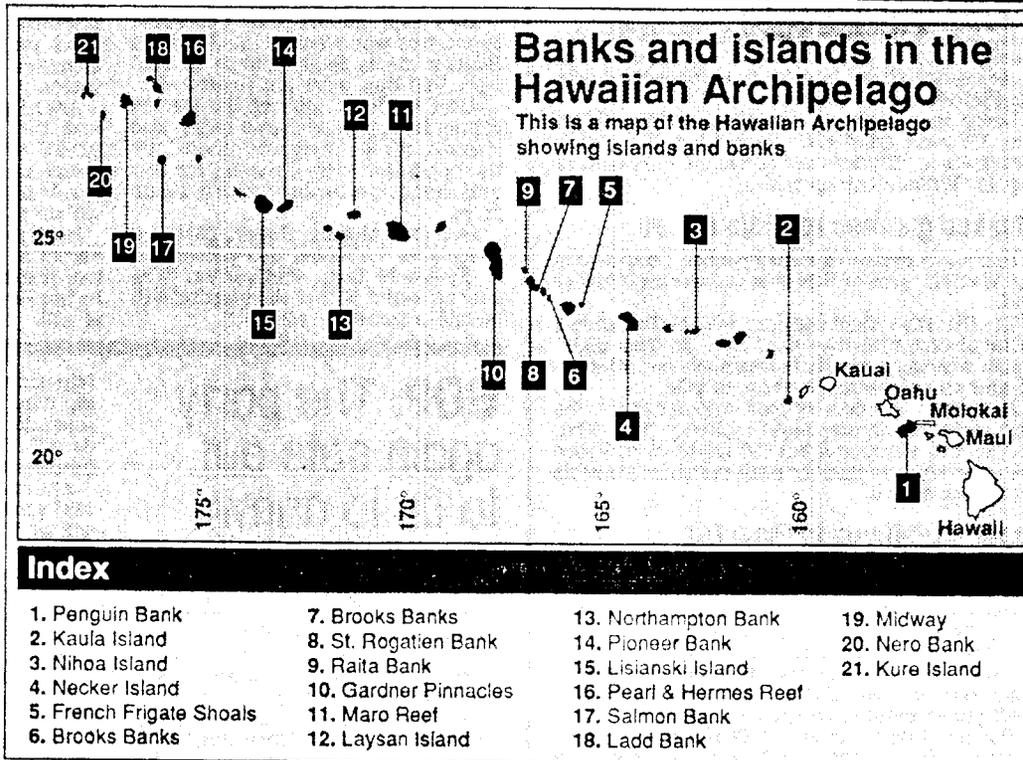
■ Drowned banks were deeper to start with because they had smaller summits and were more easily eroded, he said.

They couldn't build upward fast enough to keep pace with the sea, rising at a rate of almost half an inch per year, he said.

The islands that survived were very close to the present-day sea level during the last ice age, he said. "In other words, they were above sea level or higher."

Referring to Midway, Kure, Pearl and Hermes reefs, Grigg said, "All these flat atolls 18,000 years ago were high blocks of limestone sticking out of the water, 120 meters high (400 feet). They must have looked like castles in the sea."

Some of the proof remains to be established, he said. However, he and Epp contend that the islands that drowned were probably less than 370 feet high.



By Kevin Mond, Star-Bulletin

They were above the sea until the water rose when they were stranded and drowned, he said.

"The deep little ones drowned, and the tall large ones survived. And that explains the paradox." Those that didn't drown were close to present-day sea level and only had to grow 16 to 32 feet, he said.

Grigg and Epp suggest drilling some of Hawaii's northerly coral islands to test their theory that those with shallower foundations avoided drowning.

The drowned banks of the past also signal a warning for the future, Grigg noted.

An increase of 3 feet in sea level from global warming or other reasons would cause serious erosion problems on such flat islands as Kure, Lisianski and Laysan and Pearl and Hermes Reef and Maro Reef, Grigg said.

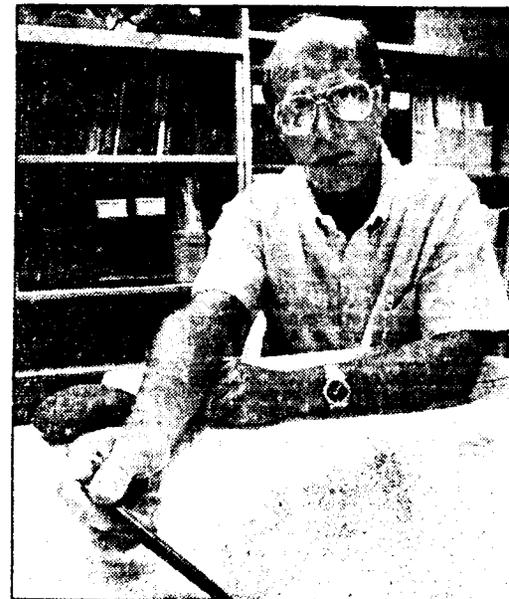
Contamination of ground-water supplies also could occur in some places, such as the Marshall Islands, where people depend upon ground water, he said.

There is a steady increase in global temperatures and sea level, but it's questionable whether it's due to the greenhouse effect or natural up and down trends in the environment, Grigg said.

"The jury is still out on the greenhouse effect."

He said scientists should know in the next five years if the greenhouse effect is real and having an impact.

"My guess is that it's real and that in five years we will be seeing more effects globally, that we'll see more warming, that sea level will continue to rise. Then, we'll know a little bit better how to manage our coastal resources," said the marine biologist.



By Dean Senoul, Star-Bulletin

Richard Grigg, University of Hawaii marine biologist, points on a map to Penguin Bank off of Molokai.