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Scientist: Seas reflect past, help reveal future

By Hillary Hauser
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In about 10,000 years, planet Earth will be in the midst of another ice age. The sea levels of the world will drop by about 360 feet, the climates we now have will shift and the tropics will become arid.

Dr. James Kennett, recently appointed as director of the UCSB Marine Science Institute, spelled out those and other futures for the planet, including a reminder that the enormous drop in sea level will cause vast areas of the now-submerged continental shelf to be exposed.

In this scenario, the outer oil platforms in the Santa Barbara Channel would all be on dry land, perched at the edge of a precipitous drop to a narrow river of an ocean, Kennett said.

Kennett, 47, who came to UCSB in July, is a leading scientist in the relatively new field of paleoceanography — "ancient oceanography," as he calls it.

Kennett coined the term in one of his first scientific papers, published in 1969. With 140 papers published since then, paleo-

ceanography has developed to where it is now recognized as one of the most important ways of determining the ancient geologic and meteorologic histories of the planet.

Through the study of the ancient oceans, Kennett said, scientists are not only provided a glimpse at the very ancient past, they also are able to predict long-term future changes for the planet.

At the very least, the science puts an end to the oft-repeated, now-untrue story that the geologic ages of Earth are moving so slowly that scientists "can't tell whether the planet is heading in or out of an ice age."

"Not so," Kennett said. "It's very predictable. Ice ages are coming and going very predictably. We can chart interglacial periods and glacial periods ... Right now, we've pretty well hit the peak of an interglacial period."

Kennett, a New Zealander who in 1966 immigrated to the United States with his wife Diana to study and teach here, first went to Florida State. From there he went to the University of Rhode Island, where he taught and researched



Dr. James Kennett is an expert in the field of paleoceanography, or "ancient oceanography."

marine geology for the past 17 years.

His appointment to the Marine Science Institute director's chair

in July ended a long period of interim management of the institute by UCSB zoology Professor Al Ebeling.

Paleoceanography, Kennett said, is the study of the Earth's systems as they have developed through time, time being the

"most important element."

None of the world's ocean systems is permanent, he said.

A paleoceanographer determines how a particular ocean system has evolved, and can thereby predict what will happen next.

For example, the Atlantic Ocean, which is a "relatively young ocean," will become larger, Kennett said. The Pacific Ocean will consequently become smaller as plate tectonics move the continent that separates them.

"In 200 million years, there will be no Pacific," Kennett said. "In very long sweeps of time, total oceans are developed or destroyed."

As for one example of an analysis of what has happened in the "short-term" past, Kennett said paleoceanographers have identified the closure of the Panama seaway in Central America as an ocean event that has significantly affected the biological and meteorological climate of the planet.

Artificially reopened by the building of the Panama Canal, the seaway was, 3 million years ago, a natural connection between the

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tropical Pacific and Atlantic, Kennett said.

The closing of the seaway led to the isolation of marine species on either side of the barrier.

In addition, the Gulf Stream was intensified into its present course — and that intensification caused ice sheets to form off Canada.

It is this sort of planetary understanding that seems to have shrunk the globe for scientists, Kennett said.

"Conceptually, the planet is getting smaller — it's easier to work with on a global basis," he said. "The satellite program enables us to get a vast picture, better than on ships."

But even though the planet is "smaller," Kennett said the areas

of discovery and scientific adventure are infinitely more vast than in past years.

He said paleoceanography got its biggest boost with the Deep Sea Drilling project, which began in the 1960s and continues today under a different name, Ocean Drilling Program.

In the Deep Sea Drilling project, scientists have taken core samples from the ocean bottom. The analyzed samples provide important insights on the geology of the oceans — how they were formed, their ages, the functions of plate tectonics and how ocean systems were formed.

Kennett joined the Deep Sea Drilling project in 1971 for an expedition in the South Pacific. Since then, he has gone on four expeditions, serving as co-chief on three of them.

Kennett's thrust for the Marine Science Institute is similar to the thrust of paleoceanography — to

integrate various sciences as they relate to the marine field.

On the UCSB campus, he envisions marine biology, chemistry and botany — as well as marine engineering, political science, and a host of other sciences with marine applications — to come together under one roof so scientists can work more closely together.

New facilities are being built on campus. One is the Marine Biotechnology Center, which will focus on the practical applications of marine science findings to industry. For example, UCSB scientists have discovered chemical properties in sea animals that are useful to the medical field, and in the center, they will develop practical applications of those properties.

Another "center," which does not involve a facility as much as it does a forum where scientists can compare notes, is the Santa Barbara Marine Studies Center, Ken-

nett said.

"When you get people together, they talk," Kennett said. "This leads to programs, studies, excitement — and breakthroughs."

Kennett also envisions a marine science auditorium for seminars and conferences, and the development of a marine policy center, where political scientists can discuss the laws as they relate to the sea.

Kennett also wants to develop a graduate curriculum on campus. UCSB presently offers no graduate courses in marine chemistry, biology, geology or oceanography, he said.

Another program that reflects Kennett's desire to get scientists together is one slated for Jan. 26-28 at the Santa Barbara Museum of Natural History.

The program, entitled "The Marine Environment of Santa Barbara and Adjacent Basins," is being

developed by the Marine Science Institute, the National Oceanic and Atmospheric Administration and the museum. It will provide a forum for scientists to discuss the particular applications of their disciplines to the Santa Barbara Channel, Kennett said.

UCSB is a prime location for marine studies, and the university is "at a threshold" in the marine science field, Kennett said.

"There's a lot of excitement around here now, a lot of things to be done," he said. "That's why I came, I felt this."

For Kennett, the ocean is everything.

"Earth is the wrong name for this planet," he said. "It should be called Ocean. We're landlubbers, that's the only reason why we called it Earth. The ocean is a tremendous driving force for Earth, including its environment."