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Bermuda plays a key role in marine carbon dioxide pollution study

GEOLOGIST Dr. Fred Mackenzie, left, and chemist Dr. Roland Wollast hope to shed light on coastal water pollution from carbon dioxide — one of the unknowns of a global threat.

Bermuda has become a key laboratory to test the environmental impact of carbon dioxide pollution which scientists say will drastically change the face of the planet within 50 years.

Two scientists at the Bermuda Biological Station hope to tell the world how coastal waters will react to the continuing onslaught of the pollution generated by the burning of fossil fuels such as oil, gas, and wood.

by Don Grearson

Dr. Fred Mackenzie, a geologist from the University of Hawaii, and Dr. Roland Wollast, a chemist from the University of Brussels, are studying the Island's sediments and shallow water life such as reef-building algaes and corals to see how their skeletal shapes and reproductive rates are affected.

From such narrow-based studies they hope to provide a few more facts to what is believed to be an inescapable future shock scenario:

■ Scientists believe the planet's surface temperature will increase four to five degrees Farenheit in 45 years and change global climate patterns.

■ The temperature rise will cause countries around the 30th parallel — Spain, Greece, the US midwest, Turkey — to become arid, possibly desert regions. They may be hard-pressed to feed their people.

■ Countries to the north such as Canada and the Soviet Union will warm up. There will be more rain and their agricultural productivity will improve.

Countries in the southern hemispheres will not be affected as much — a reflection of the fact that most carbon dioxide pollution is created and hangs over the more industrial economies of the northern latitudes.

And Dr. Mackenzie said climate projections show Bermuda would not be greatly affected. However, the temperature increase would cause Arctic and Antarctic ice to melt. The consequent rise in sea level would at the very least make today's beaches smaller and possibly inundate low-lying areas. It depends on how much ice is melted and the rate it melts.

Dr. Wollast said many countries, including the United States and European nations, have either decided, or are close to deciding, to accept and adapt to the changes. Their economies are too dependent on fossil fuels for any other course of action. Controlling emissions would not provide a significant brake on the rate of pollution.

Some countries in fact welcome the changes for their benefits. For example, the Soviet Union's northern ports — frozen for much of the year — would become ice-free.

The source of all this change is the carbon dioxide molecule — a chemical element that is the major end of product of decay of all living things. When people breathe, drive cars, burn oil or natural gas or coal to heat their homes, they produce carbon dioxide molecules.

Dr. Wollast said that up to 1980, fossil fuel burning introduced 168 billion tons of carbon dioxide into the atmosphere. Each year, planetary and human activities add another five billion tons.

Scientists have selected the year 2030 as a theoretical benchmark to describe the consequences of such pollution. It is the year when the amount of carbon dioxide in the atmosphere should double today's amount.

The reason atmospheric carbon dioxide warms the earth is that the molecules — acting like transluscent walls of a greenhouse — trap the sun's heat in the atmosphere that would normally escape back into space.

About 50 precent of carbon dioxide released into the air falls back to earth. What is not known is how much is absorbed by coastal or shallow water regions. Most water testing done to date has been on the open ocean which doesn't provide answers for the different and ecologically important coastal areas.

That is where Dr. Wollast and Dr. Mackenzie come in.

The two scientists hope to learn the capacity of shallow water sediments to store carbon dioxide.

"This not really known and Bermuda is a good place to develop an understanding of this," Dr. Mackenzie said, adding that such information would contribute to the knowledge of the earth's ability to deal with the pollution.

The second area the scientists hope to unravel is the effect carbon dioxide acidity has on shallow water organisms such as corals and algae, the predominant reef-builders in Bermuda.

In particular, they want to know whether that increased acidity changes the productivity and skeletal compositions of the organisms.

Such research is vital to helping man navigate the uncertain waters of the future. Scientists such as Dr. Wollast and Dr. Mackenzie have their eyes ahead to help map-out the possibilities. But they fear that providing answers may not be enough.

"I don't think people realise that the problems are critical," Dr. Wollast said. "I don't think we have the answers to the big problems such as climatic change and acid rain. Politicians are not interested in long-term problems. And public opinion believes scientists will solve these problems. But honestly I have some doubts a' our ability to solve the