

'Greenhouse' Indicates Dramatic Weather

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Climates like those of the movie "Monsoon Wedding" may extend more widely into Africa, North America and South America, according to a University of Oregon geologist's analysis of an ancient greenhouse event. "We know the gathering greenhouse will be warm, but this new information confirms that the contrast between the rainy season and the dry season will increase dramatically," says Greg Retallack, whose study indicating that a troubled greenhouse is brewing is published in the April issue of the journal *Geology*.

In this case, the word "troubled" refers to the stormy conditions shown to have been in play during a well-known greenhouse event some 55 million years ago during the late Paleocene epoch. Retallack explored the relationship between seasonality and rainfall in soils, then applied the same techniques to buried soils spanning the ancient greenhouse event.

"This is known to have been a time of high atmospheric carbon dioxide from studies of the breathing pores in fossil leaves," he explains. "At that time, Wyoming warmed from a mean annual temperature of some 55 degrees to a summer-like 65 degrees Fahrenheit. Rainfall in Utah jumped from 16 inches per year to 26 inches per year. As a result, sagebrush deserts of the western U.S. were transformed into sub-humid woodlands."

Retallack agrees with previous research indicating that the cause of the late Paleocene greenhouse spike, which lasted less than half a million years, was a catastrophic release of natural gas from undersea ices and permafrost.

"In a remarkable parallel to modern hydrocarbon pollution of the atmosphere, this natural methane oxidized to carbon dioxide and created a global greenhouse event," he explains. "The past methane outburst dwarfed even human consumption of hydrocarbons, and there is a danger that another similar outburst could be triggered by warming of polar and submarine ice due to human activities. Our little warming push could repeat the troubled times of 55 million years ago."

However, Retallack says these findings indicate it is unlikely that super storms will freeze North America and Europe, as depicted in the recent movie "The Day After."

"During the greenhouse spike of 55 million years ago, tropical mangroves and rain forests spread as far north as England and Belgium and as far south as Tasmania and New Zealand," Retallack says. "Turtles, alligators and palm trees graced Ellesmere Island in the Canadian Arctic, which is now the treeless abode of musk oxen and polar bears."

The bottom line? A new Ice Age is probably the least of our worries.

"Frostbite and snow-blindness are less likely to be in our future than heat stroke and malaria," Retallack asserts. "Mint julep, anyone?"

Buried soils have long been known as sources of evidence of past rainfall, but Retallack says they also can be used to determine the seasonality of rainfall as well as the amount of rainfall because the spread within the profile of carbonate nodules is related to the difference in precipitation between the driest and wettest month. Retallack uses this feature in ancient soils to reinterpret past climates.

Retallack is an authority on paleosols (ancient soils) and is writing a book about healing the global greenhouse. His textbook, "Soils of the

Past: An Introduction to Paleopedology," is widely used on college and university campuses. At the UO since 1981, his research is funded by the National Science Foundation.

Source: University of Oregon

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