Atmospheric carbon to hit five-million-year record, marine expert warns

May 3 2013

(Phys.org) —The Earth's atmospheric concentration of carbon dioxide (CO_2) is about to rise to 400 parts per million (ppm) for the first time in five million years, a scientist at The University of Queensland warned today.

UQ Global Change Institute Director Professor Ove Hoegh-Guldberg said the record 400ppm level of atmospheric carbon was expected this week, according to readings at the US Government's Earth Systems Research Laboratory in Hawaii.

He said if current trends continued, atmospheric CO_2 was expected to increase to more than 80 per cent above pre-industrial (pre-1750) levels by 2050 with the corresponding devastation to marine ecosystems like coral reefs.

This rate of increase has few, if any, parallels in the past 50 million years.

From tropical to polar oceans, the magnitude and speed of the changes expected as a result of global warming and increasing ocean acidity is likely to exceed the ability of many marine species to adapt and survive.

Professor Hoegh-Guldberg said the necessary transition to a low-carbon economy was not happening fast enough to have much effect on the problem of rapid anthropogenic global climate change.

"This is a really serious problem that demands immediate action," he said.

"There's a lot of evidence to suggest that we should stay well clear of the 450ppm or 2 degrees celcius guardrail set by the IPCC and other scientific organisations.

"But we are really underestimating the rate of change," Professor Hoegh-Guldberg said.

"This week's milestone serves as an important wake-up call for policy-makers and industry to re-double their effort to deal with the planet-threatening problem of climate change."

The growing atmospheric concentrations of man-made greenhouse gases are driving irreversible and dramatic changes to the way marine ecosystems like coral reefs, function with potentially dire impacts for hundreds of millions of people across the planet.

The "fundamental and comprehensive" changes to marine environments, include rapidly-warming and acidifying oceans, changes in water circulation and oxygen levels.

These are driving major changes in marine ecosystems: less abundant coral reefs, sea grasses and mangroves (important fish nurseries); fewer, smaller fish; a breakdown in food chains; changes in the distribution of marine life; and more frequent diseases and pests among marine organisms.

Professor Hoegh-Guldberg said the cost of transforming the world's energy systems to address rising CO2 levels was little more than one-tenth of one per cent of growth in global gross domestic product per annum.

He cited an IPCC analysis (bit.ly/MDRl1U) which shows that slowing global GDP growth by 0.12 per cent a year over the next 50 years would stabilise global temperature.

"That expenditure is the equivalent to taking off one year of GDP growth over the next 50 years," Professor Hoegh-Guldberg said.

"It would enable atmospheric concentrations of CO2 to stabilise at levels that will give marine ecosystems, such as the Great Barrier Reef a chance.

"Without this action, they don't stand a chance.

"Rising sea surface temperatures, caused by increasing concentrations of greenhouse gases, including CO2, in the atmosphere, increase the likelihood of mass bleaching events, which kill coral reefs.

"If the current trends of increasing atmospheric CO2 levels continue the Great Barrier Reef will not exist.

"It's clear we have one last opportunity to make the changes needed to preserve this brilliant and economically-important ecosystem on our planet.

"And the costs are minimal when they compared to the huge and impossible costs of trying to adapt ecosystems, agriculture and the many other systems which support humanity."

Provided by University of Queensland

https://phys.org/news/2013-05-atmospheric-carbon-five-million-year-marine-expert.html