

Acid oceans warning

The world's oceans are becoming more acid, with potentially devastating consequences for corals and the marine organisms that build reefs and provide much of the Earth's breathable oxygen.

The acidity is caused by the gradual buildup of carbon dioxide (CO₂) in the atmosphere, dissolving into the oceans. Scientists fear it could be lethal for animals with chalky skeletons which make up more than a third of the planet's marine life.

Acid oceans will be among the issues explored by Australia's leading coral scientists at a national public forum at the Shine Dome in Canberra tomorrow. The Coral Reef Futures 07 Forum is on October 18-19, 2007 and is hosted by the ARC Centre of Excellence for Coral Reef Studies (CoE CRS).

"Recent research into corals using boron isotopes indicates the ocean has become about one third of a pH unit more acid over the past fifty years. This is still early days for the research, and the trend is not uniform, but it certainly looks as if marine acidity is building up," says Professor Malcolm McCulloch of CoE CRS and the Australian National University.

"It appears this acidification is now taking place over decades, rather than centuries as originally predicted. It is happening even faster in the cooler waters of the Southern Ocean than in the tropics. It is starting to look like a very serious issue."

Corals and plankton with chalky skeletons are at the base of the marine food web. They rely on sea water saturated with calcium carbonate to form their skeletons. However, as acidity intensifies, the saturation declines, making it harder for the animals to form their skeletal structures (calcify).

"Analysis of coral cores shows a steady drop in calcification over the last 20 years," says Professor Ove Hoegh-Guldberg of CoE CRS and the University of Queensland. "There's not much debate about how it happens: put more CO₂ into the air above and it dissolves into the oceans.

"When CO₂ levels in the atmosphere reach about 500 parts per million, you put calcification out of business in the oceans." (Atmospheric CO₂ levels are presently 385 ppm, up from 305 in 1960.)

"It isn't just the coral reefs which are affected – a large part of the plankton in the Southern Ocean, the coccolithophorids, are also affected. These drive ocean productivity and are the base of the food web which supports krill, whales, tuna and our fisheries. They also play a vital role in removing carbon dioxide from the atmosphere, which could break down."

Professor Hoegh-Guldberg said an experiment at Heron Island, in which CO₂ levels were increased in the air of tanks containing corals, had showed it caused some corals to cease forming skeletons. More alarmingly, red calcareous algae – the 'glue' that holds the edges of coral reefs together in turbulent water – actually began to dissolve. "The risk is that this may begin to erode the Barrier of the Great Barrier Reef at a grand scale," he says.

"As an issue it's a bit of a sleeper. Global warming is incredibly serious, but ocean acidification could be even more so."

Source: ARC Centre of Excellence in Coral Reef Studies

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