Immediate action needed to save corals from climate change

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The journal *Science* has published a paper today that is the most comprehensive review to date of the effects rising ocean temperatures are having on the world's coral reefs. The Carbon Crisis: Coral Reefs under Rapid Climate Change and Ocean Acidification, co-authored by seventeen marine scientists from seven different countries, reveals that most coral reefs will not survive the drastic increases in global temperatures and atmospheric CO2 unless governments act immediately to combat current trends.

The paper, the cover story for this week's issue of Science, paints a bleak picture of a future without all but the most resilient coral species if atmospheric CO2 levels continue on their current trajectory. Marine biodiversity, tourism and fishing industries and the food security of millions are at risk, the paper warns. Coral reef fisheries in Asia currently provide protein for one billion people and the total net economic value of services provided by corals is estimated to be $30 billion.

Dr. Bob Steneck, of the University of Maine and co-author of the paper, said the time was right for international leaders to commit to meaningful action to save the world's coral reefs: "The science speaks for itself. We have created conditions on Earth unlike anything most species alive today have experienced in their evolutionary history. Corals are feeling the effects of our actions and it is now or never if we want to safeguard these marine creatures and the livelihoods that depend on them."

Scientists have long thought that the effects of climate change and the resulting acidification of the oceans spells trouble for reefs. Coral skeletons are made of calcium, and reef development requires plenty of carbonate ions to build these skeletons, a process called calcification. When carbon dioxide is absorbed in the ocean, the pH level drops, along with the amount of carbonate ions, slowing the growth of coral reefs. Atmospheric CO2 levels are currently at 380 parts per million (ppm) and the paper's authors, members of the Coral Reef Targeted Research & Capacity Building for Management Program (CRTR), calculate that once levels reach 560ppm, the calcification process could be reduced by up to 40 percent. Recent science also suggests that by 2100 the oceans will be so acidic that 70 percent of the habitat for deep-water corals, once considered relatively safe from the effects of climate change, will be uninhabitable.

Ocean acidification is just one example of the threats corals are facing. Bleaching, a process that is triggered when summer sea temperatures rise above normal for weeks at a time, causes corals to expel the algae that gives them their colour and nutrients. This phenomenon killed 16 percent of reef-building corals in 1997, according to the paper's authors. Destructive fishing methods, oil and gas exploration and pollution have also contributed to the global decline of coral reefs, with 20 percent already destroyed and another 50 percent threatened or verging on collapse in just the past few decades.

Consumer demand has also placed corals at risk. Popular products include coral jewelry, home decor items and live animals used in home aquaria. Corals grow so slowly it can take decades for them to recover, if at all. Catches of precious red corals, the most valuable of all coral species, provide a striking example of how demand for a fashion item can decimate a species. Red coral populations have plummeted 89 percent in the past two decades. Conscientious companies such as Tiffany & Co. removed real coral from their product lines over five

years ago.

Fernanda Kellogg, president of The Tiffany & Co. Foundation, said, “Tiffany & Co. is committed to obtaining precious materials in ways that are socially and environmentally responsible. We decided to stop using real coral in our jewelry and feel that there are much better alternatives that celebrate the beauty of the ocean without destroying it.”

Yet there is hope for corals and the life that depends on them. Scientists are calling for a reduction of carbon emissions to ensure corals’ survival. It is also vitally important to reduce local pressures on corals such as overfishing, removal for consumer items, and pollution. If these local pressures are addresssed, coral populations will be stronger and will have a better chance of surviving climate change. Tiffany & Co. is forming new partnerships with fashion designers, scientists and conservation organizations to raise awareness of the urgent need for coral conservation.

Dawn M. Martin, president of SeaWeb, said, “Corals belong in the ocean, not in our homes or in our jewelry boxes. Consumers and the fashion industry can play an important role in the ocean’s recovery by simply avoiding purchases of red and other corals. These jewels of the sea are simply too precious to wear.”

In 2008, scientists, conservationists and governments will mobilize around the world to celebrate the International Year of the Reef (IYOR), a worldwide initiative to raise awareness of the importance of corals and coral reefs. The 11th International Coral Reef Symposium will be held July 7-11, 2008, in Fort Lauderdale, Florida. Over 2,500 attendees from academic, government and conservation organizations are expected to attend to discuss the latest coral science and its implications for the survival of these international treasures.

Source: SeaWeb