

Honolulu Declaration Offers Ways to Curb Ocean Acidification

KAILUA-KONA, Hawaii, August 27, 2008 (ENS) - As the oceans absorb increasing amounts of the greenhouse gas carbon dioxide, they are becoming increasingly acid, weakening the world's coral reefs. Today, top marine scientists and The Nature Conservancy offered a plan to combat ocean acidification that includes limits on fossil fuel emissions, reduction of stress on reefs, and creation of marine protected areas to build resilience of tropical marine ecosystems.

The plan is contained in the Honolulu Declaration on Ocean Acidification and Reef Management, which the scientists presented to the U.S. Coral Reef Task Force meeting in Kailua-Kona for their last meeting during the International Year of the Reef.

The Honolulu Declaration contains the findings and recommendations of a workshop convened by The Nature Conservancy of Hawaii earlier this month. Participants included climate and marine scientists and coral reef managers from the United States and Australia - two of the countries with the world's largest stretches of coral reefs.



oral reef at Ke'ei on the island of Hawaii in ealakekua Bay near where the U.S. Coral Reef ask Force is meeting this week. (Photo by [Pete relup](#))

"The reefs of the world are at risk, and Hawaii's isolated reefs are especially vulnerable to stresses of any kind, particularly to the rapidly emerging stress brought on by climate change," said Rod Salm, director of tropical marine conservation for the Conservancy's Asia-Pacific program.

"Ocean acidification is creeping, progressive, and insidious - likened by one workshop participant to osteoporosis of the reef - a weakening of the reef structure that makes corals more vulnerable to breakage from waves and human use," Salm told the task force.

He was speaking to members of the outgoing Bush administration, as the U.S. Coral Reef Task Force is co-chaired by the departments of Commerce and of the Interior, and includes leaders of 12 federal agencies, seven U.S. states and territories, and three associated states.

Their stated mission is to lead, coordinate, and strengthen U.S. government actions to better preserve and protect coral reef ecosystems.

"Because it is difficult to detect, unlike mass coral bleaching, we don't know whether we have reached or surpassed the critical thresholds for any coral species, such as we have for temperature thresholds," Salm said.

Not only is ocean acidification hard to detect, he warned, ocean acidification is potentially irreversible.

In July, scientists at the International Coral Reef Symposium in Florida declared acidification as the largest and most significant threat that oceans face today. Current estimates show that all coral reefs could be gone by the end of the century or, in the worst case scenario, possibly decades sooner, Salm pointed out.

"Coral reefs are the lifeblood of our oceans and we depend on them for survival," said Suzanne Case, executive director of The Nature Conservancy of Hawaii. "Without urgent action to limit carbon dioxide emissions and improve management of marine protected areas, even vast treasured reefs like the Great Barrier Reef and Northwestern Hawaiian Islands will become wastelands of dead coral."

"The Honolulu Declaration offers tangible and practical steps we can take now to prevent further ocean acidification and ensure the survival of our vitally important and irreplaceable rainforests of the sea," she said.



The ocean absorbs about one-third of atmospheric carbon dioxide, which dissolves in seawater and causes an increase in acidification and a decrease in the amount of carbonate available for calcifying organisms like corals to build their skeletons.

Suzanne Case snorkels in Hawaiian waters. (Photo courtesy [The Nature Conservancy of Hawaii](#))

"If current emission trends continue," Salm told the task force, "we could see a doubling of atmospheric CO₂ in a little as 50 years; and ocean acidification will continue to an extent and at rates that have not occurred for tens of millions of years."

Some scientists believe that Hawaii reefs will succumb faster to the impacts of ocean acidification because they exist in isolation and at a higher latitude in cooler waters. Research shows that CO₂ is absorbed more readily in cooler than warmer ocean waters.

Hawaii's reefs are far removed from other coral reef systems, at the very edge of the region where reefs can grow, which means that any change in water temperature or chemistry results in greater stress and consequence, workshop participants said.



Atmospheric and marine scientist Joan Kleypas (Photo courtesy [UCAR](#))

"It is clear that seawater chemistry will change in coming decades and centuries in ways that will dramatically alter marine life," said Joan Kleypas, a scientist with the National Center for Atmospheric Research, a workshop participant and signer of the Honolulu Declaration.

"We are only beginning to understand the complex interactions between large-scale chemistry changes and marine ecology. It is vital to develop research strategies to better understand the long-term vulnerabilities of sensitive marine organisms to these changes," Kleypas said in 2006, upon publication of her report on the effects of increased atmospheric carbon dioxide on marine life.

Workshop participant Richard Feely, who also signed the Honolulu Declaration, is an oceanographer at NOAA's Pacific Marine Environmental

Laboratory in Seattle. He said ocean acidification "is leading to the most dramatic changes in marine chemistry in at least the past 650,000 years."

Salm called workshop a landmark meeting of minds that created a solid foundation for a new era of coral reef conservation, and said that action steps proposed by the group, if enacted, will help to save coral reefs from escalating destruction.

"While the consequences of inaction are too depressing to contemplate, there is good news," said Salm. "Our workshop showed that there are some practical steps we can take to buy time for coral reefs while CO₂ levels are stabilized; that there is hope for coral reefs if we act now."

The Honolulu Declaration presents seven policy recommendations and eight concerning management.

Key policy recommendations include the need to:

- stabilize CO₂ emissions and reduce marine pollution from all sources, land, sea and sky
- mandate the inclusion of climate change actions into marine protected area management plans
- increase appropriations to improve the science and actions addressing ocean acidification impacts on coral reefs

Key management recommendations include the need to:

- reduce all stresses on coral reefs as much as possible to enhance their health and resilience
- protect reefs that are less vulnerable to the impacts of ocean acidification by creating new marine protected areas and through zoning plans in existing ones
- develop, test and implement innovative interventions to reduce damage to weakened reefs and replenish species loss caused by ocean acidification
- develop a collaborative international program on ocean acidification that includes a coordinated network of monitoring