

Marine Experts Implore Governments to Slash Carbon Emissions

NICE, France, January 30, 2009 (ENS) - Immediate government action to halt greenhouse gas emissions is needed to limit damage to fisheries and coral reefs due to increasing ocean acidity, warned more than 150 marine scientists from 26 countries in a declaration issued today.

The Monaco Declaration on Ocean Acidification, released at an international aquatic sciences meeting in Nice, warns that levels of acidity are accelerating and that negative socio-economic impacts can only be limited by cutting back on the amounts of greenhouse gases released to the atmosphere.

Ocean acidification may make most regions of the ocean inhospitable to coral reefs by 2050, if atmospheric CO₂ levels continue to increase, the declaration warns.

This reef collapse could lead to substantial changes in commercial fish stocks, threatening food security for millions of people as well as the multi-billion dollar fishing industry.

The declaration is based on results from a UNESCO symposium, *The Ocean in a High-CO₂ World*, held at the Oceanography Museum in Monaco last October.

Prince Albert II of Monaco today urged political leaders to take notice of the declaration ahead of negotiations at the UN Climate Change Conference in Copenhagen at the end of the year.

"I strongly support this declaration," said the prince, whose environmental foundation provided support for the symposium. "I hope the declaration will be heard by all the political leaders meeting in Copenhagen in December 2009."



Ocean testing for acidity (Photo by Chris Sabine, Reefbase)

"The chemistry is so fundamental and changes so rapid and severe that impacts on organisms appear unavoidable," said symposium chair James Orr of the Monaco-based UN Marine Environment Laboratories, a division of the the International Atomic Energy Agency.

"The questions are now how bad will it be and how soon will it happen," said Orr.

The international community has been developing a global observing system for ocean carbon, using ships, buoys, and satellites to understand how the ocean absorbs atmospheric CO₂.

The ocean absorbs a quarter of the carbon dioxide emitted into the atmosphere from human activities. Observations from the last 25 years show increasing acidity in surface seawater, following trends in increasing atmospheric CO₂.

"Measured recent increases in ocean acidity follow exactly what is expected from basic chemistry; meanwhile, key ocean regions reveal decreases in shell weights and corals that are less able to build skeletal material," said Orr.

"The report from the symposium summarizes the state of the science and priorities for future research, while the Monaco Declaration implores political leaders to launch urgent actions to limit the source of the problem," he said.



Diver take coral samples for testing
(Photo by Christian Perthen, IAEA Marine Environmental Laboratory)

"The Monaco Declaration is a clear statement from this expert group of marine scientists that ocean acidification is happening fast and highlights the critical importance of documenting associated changes to marine life," says Professor Sybil Seitzinger, executive director of the International Geosphere-Biosphere Programme, one of the sponsors of the symposium.

Other symposium sponsors were UNESCO's Intergovernmental Oceanographic Commission, the Scientific Committee on Oceanic Research, and the International Atomic Energy Agency.

The other great oceanic consequence of high atmospheric CO₂ concentrations from fossil fuel burning - the expansion of low oxygen dead zones - was highlighted in a report Monday from a team of Danish scientists.

Dead zones across the world's oceans would expand by a factor of 10 or more if global warming continues unchecked, the Danish team warned, based on newly developed climate models that project 100,000 years into the future.

"Such expansion would lead to increased frequency and severity of fish and shellfish mortality events, for example off the west coasts of the continents like off Oregon and Chile," said Professor Gary Shaffer of the University of Copenhagen, leader of the research team at the Danish Center for Earth System Science, with scientists from the Danish Meteorological Institute and the National Space Institute.

"If, as in many climate model simulations, the overturning circulation of the ocean would greatly weaken in response to global warming," explained Shaffer, "these oxygen minimum zones would expand much more still and invade the deep ocean."

Extreme events of ocean oxygen depletion are believed to have contributed to some of the large extinction events in Earth history, including the largest such event 250 million years ago, when 96 percent of all marine species and 70 percent of terrestrial vertebrate species went extinct.