Coral Reefs and Climate Change

A Statement from the 3rd International Tropical Marine Ecosystem Management Symposium

Over 300 managers, scientists, and representatives from the private sector, development and funding agencies, and local government attended the 3rd ITMEMS in Mexico in October 2006 to share information of their experiences in tropical marine resource management. This statement was developed and adopted by the participants of ITMEMS 3 to focus attention on the emerging impacts of climate change on coral reef ecosystems, and to highlight actions required to respond to the serious long term threats posed.

There is no longer any doubt that the earth's climate is changing, causing rapidly warming seas and ocean acidification. Warming seas are causing increased mass coral bleaching and mortality, with little evidence that corals and their symbionts can evolve fast enough to keep pace.

In addition to these impacts, there is now strong evidence that acidifying seas are reducing calcification rates. Other consequences, such as rapid sea level rise and increased frequency and intensity of tropical storms, and impacts on other organisms and ecosystems, further emphasize the urgent need to limit the rate and extent of global climate change.

Projected changes in temperature and ocean acidity pose significant problems for reef-building corals. As reef-building corals build the habitat and ecosystem in which many tens of thousands of organisms live, these changes in global climate are causing major changes to the biodiversity of the ocean. Because coral reefs directly support at least 100 million people and multi-billion dollar industries, like tourism and fisheries, these impacts will cause significant socio-economic impacts and threaten food security in developing nations. around the world.

Two strategies must be implemented to mitigate the impacts of climate change to coral reefs. The first is to limit climate change. The second is to build the resilience of tropical marine ecosystems and communities to maximize their ability to resist and recover from impacts such as mass coral bleaching. Within this context our ability to effectively reduce other stressors will determine the future of coral reefs.


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Actions required to support reef resilience to climate change are:

1. Limit climate change to ensure that further increases in sea temperature are limited to 2°C above pre-industrial levels and ocean carbonate ion concentrations do not fall below 200 µmol.kg^{-1}.

2. Recognise that mass coral bleaching will have similar social and economic consequences as other environmental disasters such as oil spills and droughts and will require similar responses.

3. Facilitate and finance actions to increase resilience of coral reef social-ecological systems, particularly through marine management area networks comprising adequate areas of coral reefs and associated habitats in non-extraction zones, protection of water quality and herbivore populations, and adaptive governance.

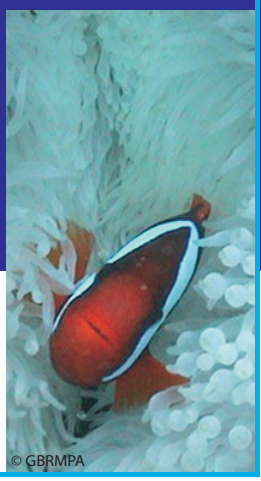
4. Facilitate and finance assessments of risk and vulnerability of coral reefs to climate change.

5. Facilitate and finance the development and implementation of coral bleaching response programs, including contingency funding.

6. Create incentives for development of partnerships for adaptation.

7. Increase investments in targeted messages to accelerate adaptation to climate change.

8. Invest in village-to-global education and communication for climate adaptation that will integrate traditional and scientific knowledge into implementation of adaptation strategies for coral reefs around the world.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Further information on Coral Reefs and Climate Change, including pragmatic, science based suggestions for adaptive management and effective response to mass coral bleaching events can be found in A Reef Manager's Guide to Coral Bleaching, available for download from: www.coris.noaa.gov