GEF CORAL REEF TARGETED RESEARCH AND CAPACITY BUILDING

– addressing critical knowledge gaps to improve management

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Introduction

A major initiative has been launched by the World Bank, the Intergovernmental Oceanographic Commission (IOC) of UNESCO and other partners, with support from the Global Environment Facility, to support coral reef resource managers with the best available scientific advice on coral reefs response to human disturbances and climate change.

The program will be addressing a number of the objectives of CBD's **Specific workplan on coral bleaching** (COP VI/3), and components of CBD's developing workplan on physical degradation and destruction of coral reefs (SBSTTA 6, recommendation VI/2).

Project goals

Through targeted research the initiative seeks to address the gaps in our knowledge of factors determining vulnerability and resilience of coral reef ecosystems to a range of stressors, and the application of this knowledge to management. Coral reef managers continue to struggle between the need for protection and providing for the needs of many direct and indirect users of coral reefs. This often means that complex tradeoffs are necessary, and frequently these decisions are made without access to sound scientific advice: 'Hard decisions require hard science, and successful long-term management without it is an illusion' (Citation: Knowlton, N. 1998), Hard Decisions and Hard Science: Research Needs for Coral Reef Management).

The GEF Targeted Research and Capacity Building Program is assembling more than 60 experienced scientists to answer critical questions concerning coral reef vulnerability to human stresses and the impacts of climate change. The program aims to:

- Address the gaps in scientific knowledge that prevent informed decision-making for coral reef management;

- Create the investigative framework and build human resource capacity to address these gaps.

This is a collaborative program between developed and developing country scientists to examine the issues on a global scale. It also aims to build capacity within coral reef countries to better manage reefs by furthering our understanding of those factors conferring resilience or increasing vulnerability of reefs to major stress, and addressing the risks to reef sustainability.

Project structure

The program will be implemented by networks of researchers, and will be guided by a Synthesis Panel and 6 thematic coral reef working groups:

Synthesis Panel:
Nancy Knowlton, Scripps Institute of Oceanography, USA; Robert Watson and John Dixon of The World Bank; Angel Alcala, Silliman University, Philippines; and the chairs of the 6 working groups' described below.

Coral Bleaching and Local Ecological Responses, Chair: Ove Hoegh-Guldberg, University of Queensland, Australia. **Goal:** to develop molecular, cellular, physiological and community indicators for coral bleaching under a range of variables, and examine potential mechanisms of coral reefs for adaptation and acclimatization to environmental change. IOC/UNESCO convened the first meeting of the Coral Bleaching working group in April, 2001, with the mandate to develop biological indicators and tools to predict environmental stress on coral reefs and examine specific physiological mechanisms leading to coral bleaching, addressing recommendations of the Convention on Biological Diversity. With support from the World Bank/GEF to develop a broader Targeted Research framework in support of management and conservation of Coral Reefs, the group expanded its mandate to also consider local ecological factors (details on www.ioc.unesco.org/coralbleaching).

Coral Diseases, Chair: Drew Harvell, Cornell University, Ithaca, NY, USA. **Goal**: to examine, prioritize and target investigations that are critical to the understanding of coral diseases, and how this information can assist managers in minimizing disease frequency and transmission;

Large-Scale Ecological Processes, Recruitment and Connectivity, Chair: Peter Sale, University of Windsor, Canada. **Goal:** To examine the role that larval transport, recruitment, post-recruitment survival, and connectivity play in networking coral reef environments, particularly as they relate to the siting and management of marine protected areas;

Coral Restoration and Remediation, Chair Loke Ming Chou, University of Singapore. **Goal:** to examine the state of remediation techniques and efficacy of potential applications, with considerations on protocols to design and implement restoration strategies; baseline data for developing effective criteria; the efficacy and feasibility of restoration and remediation techniques, and prospects for enhancing natural recovery;

Remote Sensing, Chair: Peter Mumby, University of Exeter, UK. **Goal:** to develop systems for holistic monitoring of the physical environment and stress on coral reefs; develop tools to measure the status of reef ecosystems at various ecological, spatial and temporal scales; an integrate above to provide a comprehensive perspective of how global, regional and local processes affect the health of coral reef ecosystems;

Modelling and Decision Support, Chair: John McManus, University of Miami, USA. **Goal:** to develop a coordinated information base that can improve the accuracy and reliability of forecasting and predictive modelling, and to develop modelling tools to handle data on aspects such as community dynamics, oceanography, climate, as well as socio-economic data on fisheries, tourism, and coastal development.

Project developments

Each of the working groups has systematically identified what is known and unknown, and has begun ranking research priorities to benefit management. The six working groups will integrate their efforts and new findings, and will build new research capacities between developed and developing countries by integrating expertise and skills. Each group's reports, new findings and outputs will be available online.

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Reference

Knowlton, N. (1998), Hard Decisions and Hard Science: Research Needs for Coral Reef Management. In: Coral Reefs: Challenges and Opportunities for Sustainable Management. Proceedings of an associated event of the Fifth Annual World Bank Conference on Environmentally and Socially Sustainable Development. October 9-11, 1997