

**IOC**  
**Secretary-General report:**  
**Protection of coral reefs for sustainable livelihoods and development**

**Outline:**

The report of the Secretary-General will highlight the importance of protecting coral reefs and related ecosystems for sustainable livelihoods and development, including an analysis of the economic, social and development benefits of protecting coral reefs in the context of the themes and objectives of Rio+20. At PrepCom 2 in March 2011, several member states emphasized the importance of sustainable management of oceans and the conservation of ocean resources while referring to a so called “blue economy” approach, in line with Agenda 21. SIDS countries specifically called for Rio+20 to provide support for sustainable ocean development and protection of marine resources.

The report of the Secretary-General will consider initiatives relevant for Rio+20 and its preparatory process as well as existing and forthcoming relevant reports to identify potential actions consistent with international law needed to protect coral reefs and related ecosystems. It will consider proposals for coordinated and coherent action across the United Nations system, taking into account the views of Member States, the agencies and programmes of the United Nations system and relevant international organizations, as well as the outcomes and decisions of relevant multilateral environmental agreements.

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**I. Introduction**

**II. Importance of protecting coral reefs and related ecosystems for sustainable livelihoods and development (incl. current status and adverse impacts)**

Often called “rainforests of the sea”, coral reefs form one of the most diverse ecosystems on Earth. They occupy less than one tenth of one percent of the world's ocean surface, yet provide a home for twenty-five percent of all marine species. With extremely high diversity and high productivity, millions of people are totally dependent on coral reefs for their livelihoods.

One-eighth of the world’s population (about 850 million people) lives within 100 km of a coral reef, particularly those living in developing countries or in the Southeast Asia region highly depends on coral reefs for foods and livelihood (Burke et al., 2011). In general, well-managed reef can yield between 5-15 tons of fish and seafood per square kilometer per year (Newton et al., 2007). Coral reefs also attract tourists. More than 100 countries and territories benefit from tourism associated with reefs (United Nations World Tourism Organization, 2010). In Southeast Asia, more than 60% of 557 million people live within 60 km of the coast, and are linked to the resources of the coasts (Population Reference Bureau, [www.prb.org](http://www.prb.org)). The assessment survey in 2002 showed

that the economic value of well managed coral reefs in the Southeast Asia was 12.7 billion USD (Wilkinson, 2008).

Recently, many chemical compounds potentially for treatments of cancer, HIV, and other disease have been extracted from reef organisms (Glaser et al., 2009). For example, in Thailand, a colonial tunicate *Ecteinascidia thurstoni* Herdman, 1891, which produces a group of alkaloids, exhibits potent cytotoxic activity against cancer cells of breast, lung, colorectal, and nasopharyngeal tissues (Chavanich et al., 2005). In addition to their biological value, reef structures can protect an estimated 150,000 km shoreline from the impact of storm waves and surges in more than 100 countries (Burke et al., 2011).

Over the recent decades, threats to coral reefs have been escalated by a growing global pressure: ocean warming, which can cause extensive coral bleaching events and mass mortalities, and ocean acidification, which reduces the ability of coral reefs to grow and maintain their structure and function. An estimated 75% of the world's coral reefs are threatened by local human activity, including over-fishing, coastal development and pollution, and global pressures such as climate change, warming seas and rising ocean acidification (Figure 1; Wilkinson, 2008).

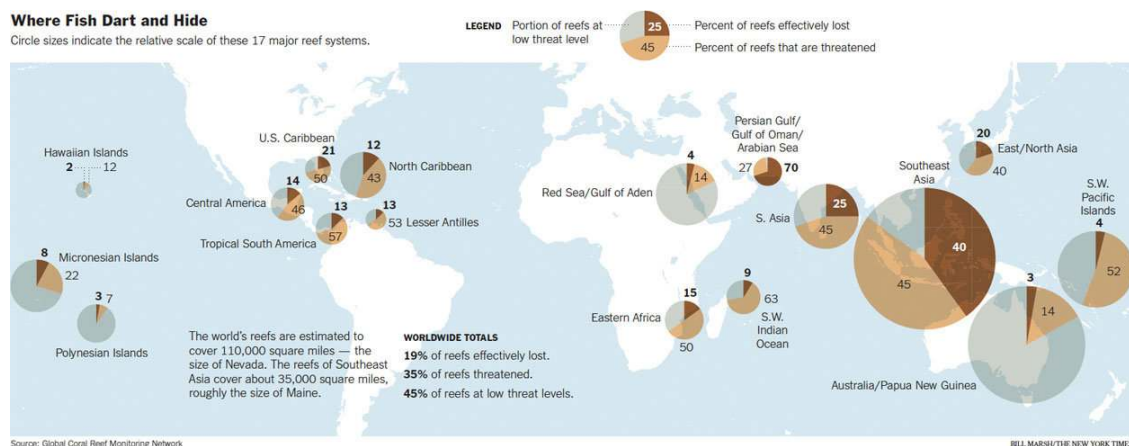


Figure 1: Level of threat of the 17 major reef systems.

In Southeast Asia region, coral reefs in the area are estimated to cover just under 100,000 km<sup>2</sup> (Wilkinson, 2008). Coral reefs monitoring between 2004 and 2008 indicates that reefs continue to show an overall decline in condition in Indonesia and Malaysia, while there have been slight improvements in the overall reef condition in Philippines, Singapore, and Thailand (Wilkinson, 2008). However, during the 2010 region-wide coral reef bleaching event, many reefs were affected and consequently died (Reef Check Indonesia, 2010; Department of Marine and Coastal Resources, Thailand, unpublished data).

### III. Coral reefs and sustainable development

- A. International agreements
- B. Resolutions
- C. Conventions
- D. Declarations
- E. Initiatives (global/regional level)

Serving as the focal point in the UN System for ocean observations, science, services and data exchange, The Intergovernmental Oceanographic Commission of UNESCO is strongly mandated to facilitate and coordinate sustained observations, modeling and analysis of marine and ocean variables and processes to support decision-making process worldwide.

At the global level, in cooperation with other United Nations agencies and governments, IOC has been developing the Global Ocean Observing System (GOOS), a permanent global system for observations, modeling and analysis of marine and ocean variables to provide accurate descriptions of the present state of the ocean, including living resources, continuous forecasts of the future conditions of the sea for as far ahead as possible, and the basis for forecasts of climate change, including those needed to monitor and protect coral reefs.

To improve scientific knowledge on ocean acidification, The Intergovernmental Oceanographic Commission of UNESCO, together with the Scientific Committee on Oceanic Research (SCOR), established one standing project titled “International Ocean Carbon Coordination Project” (IOCCP) with objectives to promote the development of a global network of ocean carbon observations for research through technical coordination and communication services, international agreement on standards and methods, and advocacy and links to the global observing systems. Moreover, an international science symposium series “The Ocean in a High-CO<sub>2</sub> World” has been organized once every four years to bring together the best scientists to share their latest research results and to set priorities for research to improve the knowledge of the processes and of the impacts of acidification on marine ecosystems, including coral reefs. The Third Symposium on The Ocean in a High-CO<sub>2</sub> World will be held 24-27 September 2012 in Monterey, California, USA.

IOC, with UNEP, IUCN and the World Meteorological Organisation formed the Global Task Team on Coral Reefs in 1991 to develop global coral reef monitoring, which was the precursor to the Global Coral Reef Monitoring Network (GCRMN), with IOC, UNEP, IUCN, World Bank and the CBD now as co-sponsors. The GCRMN address the World Summit of Sustainable Development's Plan of Implementation, the role of Small Island Development States, and the Millennium Development Goals and it assists in the development of coral reef monitoring and data management, with equal emphasis on ecological and socio-economic information.

At regional level, complementing various national and regional conservation efforts on coral reefs, IOC, through its Sub-Commission for the Western Pacific

(WESTPAC), has been making efforts to network scientists of different disciplines in the Western Pacific region, aiming to understand the biogeochemistry and ecological nature of coral reefs with differing physical and environmental settings. With identified critical regional issues affecting the health of coral reefs, the Commission has organized the training activity on "sedimentary impact on Coral Reef" in Samui, Thailand, 15-18 June, 2010 and the second training on "water quality and coral reefs" in Sanya, China, 8-11 June 2011. In response to the region-wide mass bleaching and mortality of corals in 2010, IOC is going to summarize all coral restoration methods available within the Western Pacific region, identify the best practices in the application of these techniques, and further enhance the public knowledge and awareness on coral reef restoration and conservation among the youth in the region.

It is also necessary to remark that IOC has incorporated into its International Oceanographic Data and Information Exchange (IODE) the database OBIS (Ocean Biogeographic Information System), which emanated from the decade-long Census of Marine Life programme. OBIS integrates data from all data providers across taxa and marine themes, including coral reefs. The system facilitates data discovery and research by allowing the user to search the data bank by species, higher taxa, time, location, depth and database. OBIS also provides tools for mapping, overlaying species distributions on other ocean environments and modelling activities such as potential environmental range.

IV. Economic, social, environmental and developmental benefits of protecting coral reefs, in the context of the themes and objectives of the United Nations Conference on Sustainable Development in 2012:

A. Objectives:

- secure renewed political commitment for sustainable development
- assess the progress to date and the remaining gaps in the implementation of the outcomes of the major summits on sustainable development
- address new and emerging challenges

B. Themes:

- A green economy in the context of sustainable development and poverty eradication;
- The institutional framework for sustainable development

V. Rio+20: Coral reefs within the so called "blue economy" approach

VI. The role of national legislation in protecting coral reefs (including importance of inclusion of indigenous/local communities)

VII. The way forward: Potential actions (consistent with international law) needed to protect coral reefs and related ecosystems, including proposals for coordinated and coherent action across the United Nations system

Nowadays coral reefs are threatened and degraded by a suite of anthropogenic and natural disturbances, such as over fishing, coastal development, pollution and coral disease. The effects of climate change and ocean acidification is escalating the degradation of coral reef ecosystems.

These threats to coral reefs require immediate attention of the society at all levels. From the perspectives of the Intergovernmental Oceanographic Commission, the way forward could be guided by the following considerations:

- Sharing and integrating the data and combinations of various coral reef programs will allow us to gain a broader picture on the status of coral reefs at country, regional and global level for further management plans. In many countries and regions, a number of small and large scale coral reef monitoring and/or conservation programs have been carried out, either by the countries themselves or by the international organizations/programs. However, the data are not usually shared or are not integrated. Socioeconomic factors should also be taken into account in the establishment of coral reef monitoring /conservation programs.
- Development of targeted multi-disciplinary, long-term research, monitoring programs to improve the knowledge in a comprehensive manner on the biological and oceanographic variables relevant to coral reefs.
- Further investment is required to enhance capabilities in the study, monitoring and modeling of the impacts of anthropogenic and/or climate change on ocean ecosystems, which would lead to an improved capacity to assess and predict the possible negative impacts on coral reefs so as to further devise conservation and adaptive strategies.

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