

**A World Summit on Sustainable Development Partnership Initiative**

## white water to blue water

# **A Large Marine Ecosystem Strategy for the Assessment and Management of the Caribbean Sea Large Marine Ecosystem**



**A Global Effort is underway by the World Conservation Union (IUCN), the Intergovernmental Oceanographic Commission of UNESCO (IOC), other United Nations agencies, and the US National Oceanographic and Atmospheric Administration (NOAA) to improve the long-term sustainability of resources and environments of the world's Large Marine Ecosystems (LMEs) and linked watersheds.**

**Among the White Water to Blue Water (WW2BW) initiatives is an activity that promotes a cross sectoral approach to the management of the Caribbean Sea Large Marine Ecosystem, and its associated watersheds and coastal zones. This WW2BW effort will foster improved regional communication and collaboration between the major stakeholders of the Caribbean Sea LME, including governments, non-governmental organizations, foundations, corporations, international organizations, and universities.**

# **WW2BW** and LMEs

The goal of the White Water to Blue Water (WW2BW) initiative is to promote and implement partnerships for the sustainable development of Caribbean Sea resources with a focus on four themes:

- ◆ **Marine ecosystem-based management**
- ◆ **Integrated watershed management**
- ◆ **Sustainable tourism**
- ◆ **Environmentally sound marine transportation**

## **Marine Ecosystem-Based Management**

The Marine Ecosystem Theme is focused on the structure and implementation of the Large Marine Ecosystem (LME) approach to ensuring the long-term productivity and sustainability of the living resources and the environment of the Caribbean Sea LME. This concept recognizes that marine pollution and living marine resources are not limited by political and geographical boundaries. Management of the Caribbean Sea LME requires a large scale, concerted and holistic approach for assessment and control actions that can accommodate scaling up from small local embayments and estuarine problem areas to national and international ecosystem-wide sustainability problems areas. Focal areas for consideration in the planning and implementation of the LME approach to the assessment and management of marine resources and their environments include: Productivity; Fish and Fisheries (includes conservation of biodiversity); Ecosystem Health and Pollution; Socioeconomic Factors; and Governance (includes adaptive management and stakeholder participation).

## **WSSD, Large Marine Ecosystems, and the GEF**

Following a three-year pilot phase (1991-1994), the Global Environment Facility (GEF) was formally launched to forge cooperation and finance actions in the context of sustainable development that address critical threats to the global environment including: unsustainable fishing practices, biodiversity loss, climate change, degradation of international waters, ozone depletion, and persistent organic pollutants. In 1995, the GEF Council included the concept of LMEs in its GEF Operational Strategy as a vehicle for promoting ecosystem based management of coastal and marine resources in the international waters focal area within a framework of sustainable development.

A GEF-LME project is under preparation by countries of the Caribbean region for “Sustainable Management of the Shared Living Marine Resources of the Caribbean Large Marine Ecosystem (CLME) and Adjacent Regions”, and IOCARIBE member countries endorse the proposal.

At the World Summit on Sustainable Development in Johannesburg in August 2002, a significant milestone was reached when 191 nations agreed to a Plan of Implementation (POI) for several specific ecosystem related targets including: achievement of “substantial reductions in land based sources of pollution by 2006; introduction of the ecosystems approach to marine resource assessment and management by 2010; designation of a network of marine protected areas by 2012; and the maintenance and restoration of fish stocks to maximum sustainable yield (MSY) levels by 2015.

Significant progress has been made in moving toward the WSSD targets within the framework of Large Marine Ecosystem (LME) based assessment and management actions in the United States, and in developing countries in Africa, Asia, Latin America and emerging democratic states of Eastern Europe. LMEs are regions of ocean space encompassing coastal areas from river basins and estuaries to the seaward boundaries of continental shelves, enclosed and semi-enclosed seas, and the outer margins of major current systems. They are relatively large regions on the order of 200,000 km<sup>2</sup> or greater, and characterized by unique bathymetry, hydrography, productivity, and trophically dependent populations. Sixty- four LMEs around the world produce 95% of the global marine fish catch. They are also the sites of coastal ocean pollution and coastal habitat alteration.

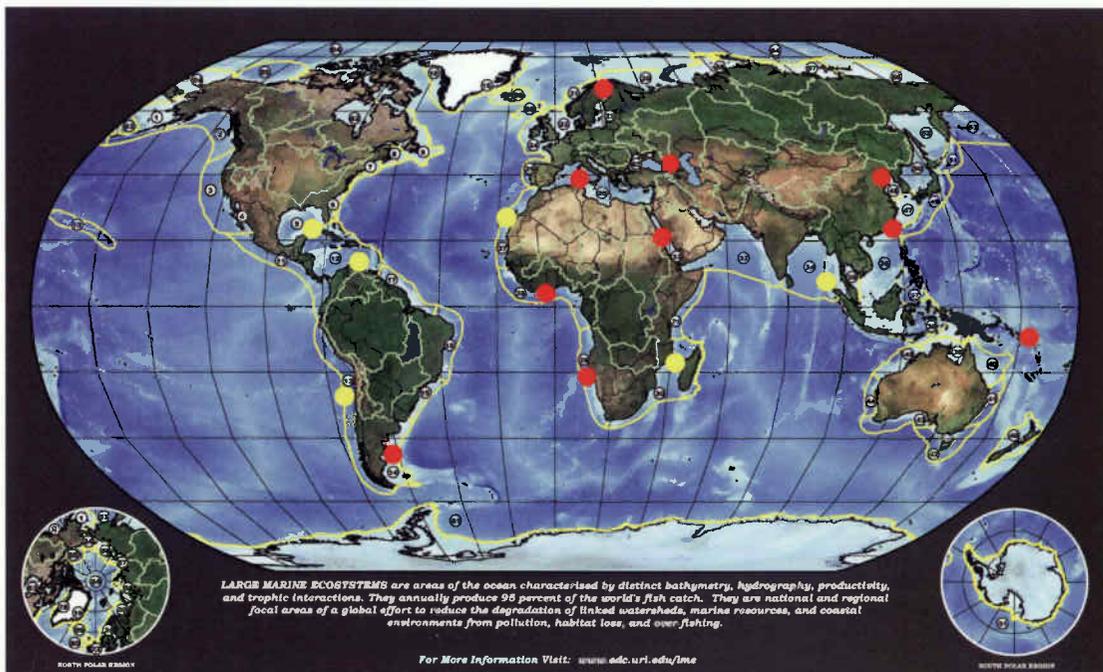
## Role of the GEF

GEF projects are implemented by UNDP, UNEP, UNIDO and the World Bank, and expanded opportunities exist for other executing agencies. In recognition of the interest expressed by coastal countries to halt and reverse the deteriorating condition of coastal areas, IUCN and NOAA have joined in an action program to assist developing countries in planning and implementing an ecosystem-based strategy that is focused on LMEs as the principal assessment and management units for coastal ocean resources. In a complementary exercise, the IOC of UNESCO and its partners (WMO, UNEP, and ICSU) are working through the Living Marine Resources and Coastal Modules of the Global Ocean Observing System to develop ecosystem monitoring and forecasting methods that can be applied by coastal nations to marine ecosystems of coastal seas.

Countries of the Caribbean have indicated the need for attention to shared living marine resource management at the regional and international levels through participation in regional arrangements, and signing of international treaties and agreements. IOCARIBE Member Countries have endorsed development of a GEF-LME project at two consecutive Subcommission Meetings (1995 and 1999).

Countries expressing interest in Project participation include Antigua and Barbuda, Bahamas, Barbados, Belize, Brazil, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, France (French Guiana, Guadeloupe, Martinique, St. Barthelemy, St. Martin), Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, The Netherlands (Aruba, Bonaire, Curacao, Saba, St. Eustatius, St. Maarten), Trinidad and Tobago, United Kingdom (Anguilla, Bermuda, British Virgin Islands, Cayman Islands, Montserrat, Turks and Caicos Islands), United States of America (Puerto Rico, US Virgin Islands), and Venezuela.

Ten recently approved GEF-LME projects involve 72 developing nations whose living resources, pollution loading, and critical habitats have transboundary implications. An additional 7 GEF-LME projects are in preparation involving 54 countries. The growing number of country driven commitments to change as fostered by the GEF, provide an unprecedented opportunity for countries in the Caribbean region to move toward accelerating the transition to the sustainable use, conservation, and development of coastal and marine resources for the benefit of the people of the Caribbean.





## The Caribbean Sea Large Marine Ecosystem Project

The Caribbean Sea Large Marine Ecosystem project will serve as a platform for governments and other stakeholders to pursue their sustainable development agendas by improving the efficiency and effectiveness of existing programs, seeking new resources, and leveraging current resources through partnership projects that contribute to the sustainability of the Caribbean Sea LME.

The Caribbean Sea and adjacent Large Marine Ecosystems include a wide variety of tropical ecosystems and associated biodiversity. The area encompasses a large proportion of the world's coral reef resources, including the second longest barrier reef, the Meso-American Barrier Reef System. The sea is an important source of food and employment for most Caribbean countries, through both fisheries and tourism. Thus the sustainability of its living resources is of considerable importance to an appreciable proportion of the region's countries.

An opportunity is provided by this project for the Caribbean states to address squarely and fully the World Summit on Sustainable Development (WSSD) goals regarding fisheries, particularly the goal pertaining to restoration of stocks to levels that can produce maximum sustainable yields. The project enables the region to participate more fully in moving toward WSSD initiatives.

Throughout the Caribbean, the majority of the population inhabits the coastal zone, and there is a very high dependence on marine resources for livelihoods from fishing and tourism, particularly among the small island developing states (SIDS). The region is characterized by a diversity of national and regional governance and institution arrangements, stemming primarily from the governance structures established by the countries that colonized the region.

Fisheries play a major role in Caribbean countries. The fisheries of greatest importance are for offshore pelagics, reef fishes, lobster, conch, shrimps, continental shelf demersal fishes, deep slope and bank fishes and coastal pelagics. There is a variety of less important fisheries such as for marine mammals, sea turtles, sea urchins, and seaweeds. Fishery types vary widely in state of exploitation, vessel and gear used, and approach to their development and management. Most coastal resources are considered to be overexploited and there is increasing evidence that pelagic predator biomass has been severely depleted.

Sustainable management of shared living marine resources of the Caribbean Sea Large Marine Ecosystem and adjacent areas is the overall objective of this GEF-LME Project that is to be conducted through an integrated management approach that will meet the WSSD target for sustainable fisheries.

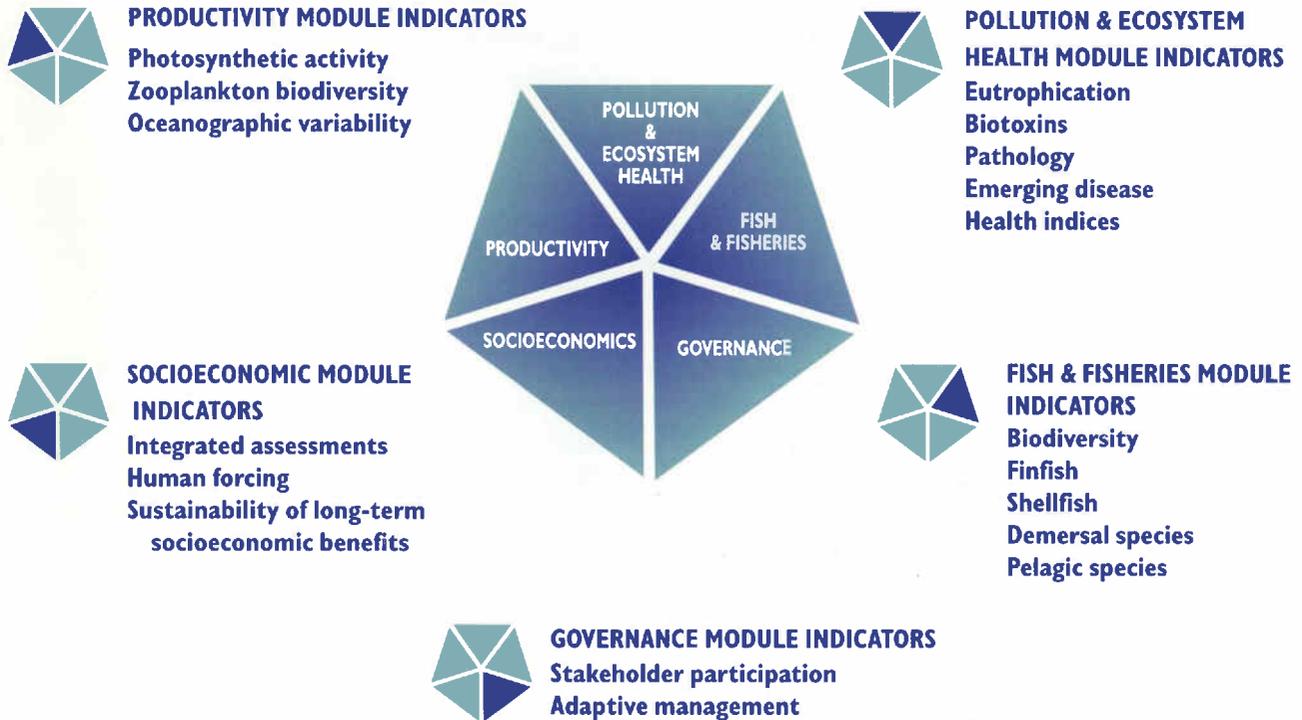
A 5-module GEF-LME methodological approach to ecosystem recovery, sustainability, and management is being operationalized by GEF supported projects in Africa and Asia, and are suitable for application in the Caribbean region.

The World Summit on Sustainable Development  
WW2BW Partnership Initiative  
Introducing the Ecosystem-Based Management Approach to the Caribbean



# Modular Assessments

## Support LME Restoration and Sustainable Development



## Five Module LME Approach

Large Marine Ecosystems are regions of ocean space encompassing coastal areas from river basins and estuaries to the seaward boundaries of continental shelves and the outer margins of the major current systems. They are relatively large regions on the order of 200,000 km<sup>2</sup> or greater, characterized by distinct: (1) bathymetry, (2) hydrography, (3) productivity, and (4) trophically dependent populations. On a global scale, 64 LMEs produce 95 percent of the world's annual marine fishery biomass yields. Within their waters, most of the global ocean pollution, overexploitation, and coastal habitat alteration occur.

For 33 of the 64 LMEs, studies have been conducted of the principal driving forces affecting changes in biomass yields. They have been peer reviewed and published in twelve volumes ([www.lme.noaa.gov](http://www.lme.noaa.gov)). Based on lessons learned from the LME case studies, a five-module strategy has been developed to provide science-based information for the monitoring, assessment, and management of LMEs. The modules are focused on LME: (1) productivity, (2) fish and fisheries, (3) pollution and ecosystem health, (4) socioeconomics, and (5) governance.

The five-module approach to LMEs that has proven useful in other ecosystems is essentially customized to fit the situation within the context of the TDA process and the SAP process at the GEF, for particular groups of nations sharing an LME, based on available information and capacity. These processes are critical for integrating science information into management actions and this concept is being demonstrated in eight funded projects, four known as Comprehensive LME Demonstrations and more selectively in four other LMEs based on country interests in certain transboundary issues. This demonstrates flexibility of the LME approach.

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