



Empowered lives.
Resilient nations.

STRESS, SUSTAINABILITY, AND DEVELOPMENT OF LARGE MARINE ECOSYSTEMS DURING CLIMATE CHANGE: POLICY AND IMPLEMENTATION



Large Marine Ecosystems
Volume 18



*Empowered lives.
Resilient nations.*

UNDP partners with people at all levels of society to help build nations that can withstand crisis, and drive and sustain the kind of growth that improves the quality of life for everyone. On the ground in 177 countries and territories, we offer global perspective and local insight to help empower lives and build resilient nations.

www.undp.org



The GEF unites 182 countries in partnership with international institutions, non-governmental organizations (NGOs), and the private sector to address global environmental issues while supporting national sustainable development initiatives. Today the GEF is the largest public funder of projects to improve the global environment. An independently operating financial organization, the GEF provides grants for projects related to biodiversity.

www.thegef.org

November 2013

Stress, Sustainability, and Development of Large Marine Ecosystems During Climate Change: Policy and Implementation

Copyright © 2013 United Nations Development Programme

Editors: Kenneth Sherman, Sara Adams

United Nations Development Programme

304 East 45th Street, 9th Floor

New York, NY 10017, USA

www.undp.org/water

Global Environment Facility

1818 H Street, NW

MSN P4-400

Washington DC 20433, USA

www.thegef.org

Cover photo: © image of earth from space, courtesy of NASA from Apollo series

***Stress, Sustainability, and Development
of Large Marine Ecosystems during
Climate Change:
Policy and Implementation***

Edited by Kenneth Sherman and Sara Adams

National Oceanic and Atmospheric Administration
United States Department of Commerce
National Marine Fisheries Service
Large Marine Ecosystem Program
Narragansett Laboratory
Narragansett, Rhode Island 02882 USA

FOREWORD

Large Marine Ecosystems (LMEs) annually produce 80 percent of the world's marine fish catch. These coastal ocean areas are overfished; polluted; and subject to nutrient over enrichment, acidification, accelerated warming from climate change, loss of biodiversity and key habitat areas under stress—including sea grasses, mangroves and coral reefs. These stressors are impacting the sustainable development of an estimated \$12 trillion in goods and services contributed annually by LMEs to the global economy.

In June 2012, world political leaders at the United Nations Conference on the Environment and Development in Rio de Janeiro (Rio+20) committed to:

“ . . . protect, and restore, the health, productivity and resilience of oceans and marine ecosystems, and to maintain their biodiversity, enabling their conservation and sustainable use for present and future generations . . . ”

Consistent with meeting the challenge of Rio, leaders directing the world's top financial, scientific, and technical institutions engaged since the mid-1990s in supporting sustainable development of the oceans, came together at an LME Conference convened at Boston's John F. Kennedy Library on 16 February 2013. They came from Copenhagen, New York, Paris and Washington D.C. to present their pathways towards the recovery and sustainability of LMEs during climate change. Other attendees included invited guests, scientists in Boston for the annual meeting of the American Association for the Advancement of Science, the public, and the press.

The institutional leaders from the National Oceanic and Atmospheric Administration, the Global Environment Facility, the International Council for the Exploration of the Sea, the Intergovernmental Oceanographic Commission of UNESCO and the Environment and Energy Group of the United Nations Development Programme spoke of their institutions' partnerships and their commitment to supporting the recovery and sustainable development of the world's LMEs.

The Global Environment Facility, World Bank, and United Nations are partnering with the international coastal ocean community in providing over \$3 billion dollars in financial, scientific, and technical assistance to countries in Asia, Africa, Latin America, the Pacific, and eastern Europe in support of LME projects in over 100 developing countries that are moving toward restoring the health, food security, and economic vitality for billions of people around the globe dependent on LME goods and services.

In addition to the keynote talks of leaders from NOAA, the GEF, ICES, UNDP and IOC-UNESCO on the pathways forward to sustainable development of LMEs, the successful recovery and growth of LME goods and services will require more attention to multi-sectoral agreements for the use of LME space. Multiple uses include hydrokinetic energy, coastal transportation, fisheries, tourism, mining, and gas and oil production. Invited speakers and

panelists shared experiences in coastal and marine spatial planning from generic and case study perspectives.

The Conference at the John F. Kennedy Library was followed by a linked LME science symposium on 17 February at the American Association for the Advancement of Science meeting at Boston's Hynes Convention Center with invited speakers providing results of LME case studies where actions have been initiated for moving toward sustainable development of the Benguela Current, Yellow Sea, and Humboldt Current LMEs.

Following reviews of LME presentations made by the world leaders of ocean finance and scientific institutions and experts on marine spatial planning at the JFK Library Conference, and the papers presented at the AAAS meeting, the results have been edited and arranged into eleven chapters presented in this volume. The chapters represent a substantial commitment of scientific partnerships and financial support by the GEF, ICES, UNDP, IOC-UNESCO, and NOAA, towards the recovery and sustainable development of the world's LMEs.

The Editors
Narragansett R.I.
November 2013

MESSAGE FROM THE CHAIRMAN OF THE CONFERENCE AND SYMPOSIUM ORGANIZING COMMITTEE



When deliberating on the venue for the Conference, the Organizing Committee considered it fitting to link the LME policy and management talks and the AAAS LME science presentations to the ideals and challenges of international cooperation pursued by President Kennedy and illustrated throughout the JFK Library and Museum. Whether the challenge was a dramatic stand-down to a global nuclear exchange, or a challenge to place a man on the moon, it was treated by President Kennedy with careful deliberation, resulting in successful outcomes of global significance.

The unprecedented stress and degraded condition of our oceans and especially the intensely used Large Marine Ecosystems around the coasts of the continents presents another challenge of global significance. We are faced with recovering and sustainably developing goods and services of large marine ecosystems contributing trillions of dollars annually to the global economy. It is in President Kennedy's spirit of responding to global challenges that the Conference was convened at the JFK Library and Museum.

The invited speakers share concerns and offer solutions for improving the condition of the world's LMEs. They are leaders in a collaborative international mobilization of scientific and financial support to over 100 developing nations engaged in the recovery and sustainable development of Large Marine Ecosystems in Africa, Asia, Latin America, the Pacific, and eastern Europe.

Kenneth Sherman, Chairman LME Conference
and AAAS LME Symposium Organizing Committee

ACKNOWLEDGEMENTS

We are pleased to acknowledge the financial and logistical support of the Gordon and Betty Moore Foundation, the Global Environment Facility, the United Nations Development Program, NOAA, the International Union for the Conservation of Nature (IUCN), and the wonderful staff support provided by the Kennedy Library and Museum, especially Kate Hanagan, Special Events Coordinator; Nancy Tobin, our Event Coordinator, and Rhonda Elkins and Gail Delano. We are thankful to Nicole Maylett, Meetings Manager; Ginger Pinholster, Director of the Office of Public Programs; and Cassandra Jones, Program Associate for the Office of Public Programs of the American Association for the Advancement of Science (AAAS) for permission to link the LME JFK Library Conference to the annual meeting of the AAAS and the Symposium on Moving Toward Sustainable Development of Large Marine Ecosystems convened at Boston's John Hynes Convention Center.

The LME Conference and AAAS LME Symposium Organizing Committee:

Barry Gold, the Gordon and Betty Moore Foundation

Andrew Hudson, UNDP, NY

James Oliver, IUCN, Gland, Switzerland

(Committee Chair) Kenneth Sherman, NOAA, Narragansett, RI

Ivan Zavadsky, the GEF, Washington, DC

TABLE OF CONTENTS

Title page	i
Foreword	ii
Message from the Chairman of the LME Conference and AAAS LME Symposium Organizing Committee	iv
Acknowledgements	v
Table of Contents	vi
List of Contributors	viii
 PART ONE: INTERNATIONAL LEADERS WEIGH IN ON LMEs	 1
 1. Large Marine Ecosystems: the Leading Edge of Science, Management and Policy <i>Jane Lubchenco, Under Secretary of Commerce for Oceans and Atmosphere and Administrator, National Oceanic and Atmospheric Administration (NOAA), 2009-2013</i>	 2
 2. GEF Support Toward Sustainable Development of Large Marine Ecosystems <i>Naoko Ishii, Chief Executive Officer of the Global Environment Facility (GEF)</i>	 20
 3. Accelerated Warming and Sustainability of the Baltic Sea Large Marine Ecosystem <i>Anne Christine Brusendorff, General Secretary of the International Council for the Exploration of the Sea</i>	 24

预览已结束，完整报告链接和二维码如下：

https://www.yunbaogao.cn/report/index/report?reportId=5_13434

