



Status and Trends of Caribbean Coral Reefs: 1970–2012

EDITED BY
JEREMY JACKSON · MARY DONOVAN · KATIE CRAMER · VIVIAN LAM

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Dedication: This book is dedicated to the many people who have worked on coral reefs to understand them, to protect them, and to appreciate their beauty and meaning for humanity and the natural world. We also recognize the International Coral Reef Initiative and partners, and particularly the people of all nations throughout the wider Caribbean region who continue to strive for the existence of healthy Caribbean reefs for future generations.

Note: The conclusions and recommendations of this volume are solely the opinions of the authors and contributors and do not constitute a statement of policy, decision, or position on behalf of the participating organizations.

Front Cover: Dead parrotfish (*Sparisoma viride*) caught in gillnet in front of a completely destroyed reef (Photo by Ayana Elizabeth Johnson)

Back Cover: School of the stoplight parrotfish *Sparisoma viride* on the south shore of Bermuda. (Photo by Philipp Rouja)

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GCRMN

GLOBAL CORAL REEF
MONITORING NETWORK

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FOREWORD

The Caribbean is a sprawling sea of deep nutrient-poor waters punctuated by great oases of biomass production and diversity of species, otherwise known as coral reefs. These reef systems circumscribe the shallow seafloor surrounding islands and delimit the continental shelf edge abutting contiguous landmasses: They also populate sunken and receding sub-marine banks.

The reef systems of the Caribbean provide a wide range of services for almost 40 million people, which affect livelihood, economic progress, food security, cultural expressions and communion with nature. They are the basis of the tourism and fishing industries in the insular Caribbean and most of Central America, Mexico and the south-eastern United States. Both tourism and fisheries development are major contributors to GDP and employment in the region.

The interactions of the peoples of the Caribbean with the reef ecosystems do carry a cost in terms of pollution, mechanical destruction and degradation as well as the effects of climate change. These ravages impair and erode the functionality of the reef and thus their facility to deliver useful service.



If the impacts to the reef are to be avoided, or diminished or ameliorated and if the vitality and vigour of the system is to be retrieved and sustained over time - there would be the need to improve our knowledge and understanding of the extent of the impacts and how the reef ecosystems respond to these and what measures are needed to rescue and improve the situation. In this regard the intervention of science and specifically the genesis of the publication: '*Status and Trends of Caribbean Coral Reefs: 1970 – 2012*' becomes highly relevant. This seminal work by Professor Jeremy Jackson and his editorial team is the most comprehensive analysis and compilation of information on coral reef in the Caribbean over the past 40 years. Although the report clearly shows that there has been an ongoing decline in coral cover and reef health, there is also a strong message of hope that with the appropriate management interventions we can affect the desired outcome of a better balance between man and the reef environment.

A stylized, handwritten signature in dark blue ink, reading 'Lisel Alamilla'.

Lisel Alamilla
Minister of Forestry, Fisheries
and Sustainable Development
Belize

INTRODUCTION

This is the 9th status report since the Global Coral Reef Monitoring Network (GCRMN) was founded in 1995 as the data arm of the International Coral Reef Initiative (ICRI) to document the ecological condition of coral reefs, strengthen monitoring efforts, and link existing organizations and people working on reefs worldwide. The US Government provided the initial funding to help set up a global network of coral reef workers and has continued to provide core support. Since then, the series of reports have aimed to present the current status of coral reefs of the world or particular regions, the major threats to reefs and their consequences, and any initiatives undertaken under the auspices of ICRI or other bodies to arrest or reverse the decline of coral reefs.

IUCN assumed responsibility for hosting the global coordination of the GCRMN in 2010 under the scientific direction of Jeremy Jackson with the following objectives:

1. Document quantitatively the global status and trends for corals, macroalgae, sea urchins, and fishes based on available data from individual scientists as well as the peer reviewed scientific literature, monitoring programs, and reports.
2. Bring together regional experts in a series of workshops to involve them in data compilation, analysis, and synthesis.
3. Integrate coral reef status and trends with independent environmental, management, and socioeconomic data to better understand the primary factors responsible

particularly beneficial or harmful, and to vigorously communicate results in simple and straightforward terms to foster more effective conservation and management.

This and subsequent reports will focus on separate biogeographic regions in a stepwise fashion and combine all of the results for a global synthesis in the coming years. We began in the wider Caribbean region because the historical data are so extensive and to refine methods of analysis before moving on to other regions. This report documents quantitative trends for Caribbean reef corals, macroalgae, sea urchins, and fishes based on data from 90 reef locations over the past 43 years. This is the first report to combine all these disparate kinds of data in a single place to explore how the different major components of coral reef ecosystems interact on a broadly regional oceanic scale.

We obtained data from more than 35,000 ecological surveys carried out by 78 principal investigators (PIs) and some 200 colleagues working in 34 countries, states, and territories throughout the wider Caribbean region. We conducted two workshops in Panama and Brisbane, Australia to bring together people who provided the data to assist in data quality control, analysis, and synthesis. The first workshop at the Smithsonian Tropical Research Institute (STRI) in the Republic of Panama 29 April to 5 May, 2012 included scientists from 18 countries and territories to verify and

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