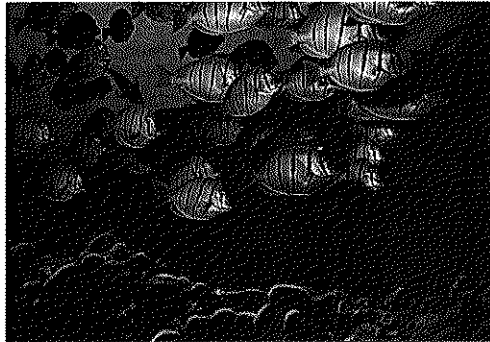
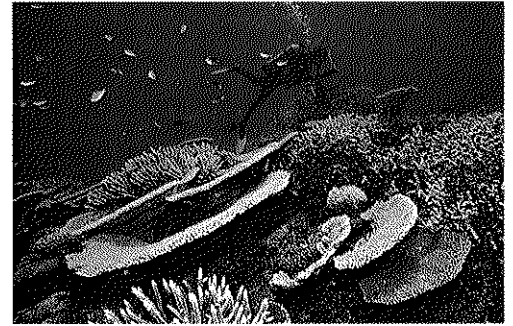
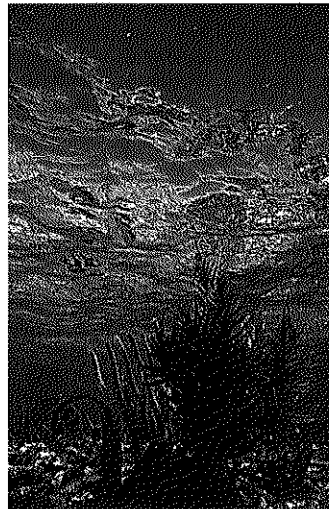
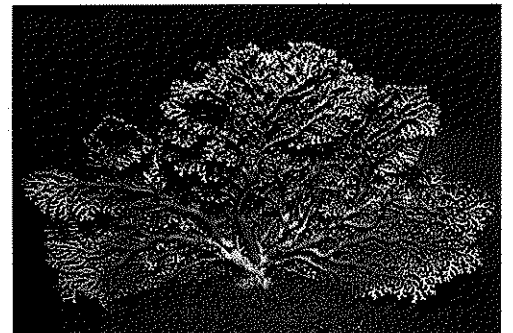
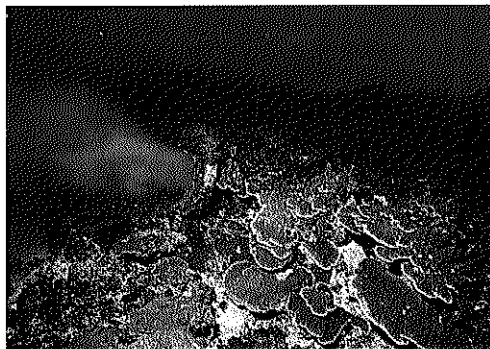


Status of Coral Reefs in the Pacific



Edited by
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University of Hawaii
and
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PREFACE

In June of 1993, Robert N. Ginsburg of the University of Miami organized a Colloquium on "Global Aspects of Coral Reefs: Health, Hazards and History." One hundred and twenty-two marine scientists representing 22 countries attended the four-day meeting held at the University of Miami and presented the results of their research on 62 coral reefs around the world. A major conclusion of the Colloquium was that while vast areas of remote reefs have not been studied, many nearshore reefs adjacent to, or near, urban population centers are suffering significant ecological decline. Of approximately 600,000 km² of coral reefs worldwide, it was estimated that about 10% have been seriously degraded and another 20-30% may decline significantly in the next 20 years. The principal causal factors of anthropogenic origin listed by the Colloquium were overfishing, eutrophication and sedimentation. The most significant sources of impact from natural factors were listed as hurricanes, unusually high temperature associated with El-Niño-Southern-Oscillation (ENSO) events, various coral diseases, and imbalances in key predators (crown-of-thorns and urchins). The Colloquium recognized an urgent need to conduct a comprehensive assessment of coral reefs worldwide and to evaluate existing impacts. In essence, a call to action to assess the status of coral reefs worldwide was issued by the coral reef scientific community. It was the beginning of what was to become, four years later, the International Year of the Reef (IYOR).

During the time between the Miami Colloquium and the IYOR in 1997, the United States State Department initiated a similar program designed to conserve and manage global coral reef resources. This program has been named the



International Coral Reef Initiative (ICRI). Its major thrust is to organize governmental partnerships with those countries that have coral reefs in order to protect, restore and sustain their coral reef resources. Many of the goals and objectives of the IYOR and the ICRI programs share common ground. This book is one example of the cooperation that exists between the two programs. By way of a grant from ICRI to the IYOR, funding was provided to the Pacific Science Association's Scientific Committee on Coral Reefs to conduct an assessment of coral reefs in the Pacific Ocean. The grant was awarded to Robert N. Ginsburg of the University of Miami. In turn, Ginsburg used part of the funds in the grant to support the activities of the PSA Coral Reef Scientific Committee. Ten internationally recognized coral reef scientists, all but one, members of the PSA Scientific Committee on Coral Reefs, were commissioned to prepare reports on the status and health of coral reefs in their region or country. Areas represented include the Central Pacific (James E. Maragos), the Eastern Pacific (Peter W. Glynn), French Polynesia (Claude E. Payri and Fabienne Bourdelin), the Hawaiian Islands (Richard W. Grigg), Indonesia (Aprilani Soegiarto), Guam and the Northern Mariana Islands (Charles Birkeland), Okinawa (Kiyoshi Yamazato), the Philippine Islands (Helen Yap),

Taiwan (Chang-feng Dai), and Thailand (Surapol Sudara).

The Sea Grant College Program at the University of Hawaii became a fourth partner in this cooperative quadripartite by agreeing to publish the results of the studies. Richard W. Grigg as a member of the Organizing Committee of the IYOR and Chuck Birkeland as Chairman of the PSA Scientific Committee on Coral Reefs coordinated the PSA activity and are co-editors of the book.

Publication of the "Status of Coral Reefs in the Pacific" was scheduled to coincide with the VIII PSA Inter Congress held in Suva, Fiji, July 13-19, 1997. Results reported in this volume were presented and discussed at the Fiji meeting.

In brief, the results of coral reef assessments in the Pacific reported in this volume are as follows:

The condition of coral reefs in the Pacific varies enormously depending on their exposure to hurricanes and typhoons, extremes in El Niño events, and anthropogenic stress which is most pronounced in proximity to urban centers. Reefs in areas of high population density show general declines in health as measured by coral cover and the biomass and size frequency of coral reef fish. Overfishing by foreign vessels in remote areas for target species such as Tridacna, Torchus and high priced fishes such as Napoleon wrasses and groupers is a mounting problem.

Eastern Pacific reefs are in the worst condition having been devastated by a large El Niño event in 1982-83 and suffered secondary losses due to bio-erosion during subsequent years. Coral reefs in the best condition and least impacted by anthropogenic sources of stress (overfishing, sedimentation and eutrophication) are in the Central Pacific, including the Hawaiian Islands and the Northern Mariana Islands. In general, these reefs are under the control of natural processes although increasingly serious local impacts from various anthropogenic sources exist and are associated with a widespread trend in increasing human population.

Reefs most impacted by human activities, (primarily sedimentation and overfishing), exist in the Indo-West-Pacific and Southeast Asia regions. Recent surveys show that the percent of coral reefs described as low (0-25% coral cover) or moderate (25-50% coral cover) in Taiwan, the Philippine Islands, Indonesia and Thailand are 87%, 70%, 71% and 64%, respectively. Problems in all four areas are described as increasing, associated with increasing human population. Since most impacts are anthropogenically induced, management solutions are feasible, although socially and economically difficult. Clearly, coral reefs in the Southeast Asia region are in the most urgent need of remediation.

The editors would like to acknowledge Robert N. Ginsburg, the father of the IYOR, for his leadership and vision in establishing the program and for his help in obtaining support for the PSA activity that led to this volume. The editors also acknowledge and thank the authors of the individual chapters that make up the book. We also thank the University of Hawaii Sea Grant College Program for publishing our research results in this volume. Priscilla Billig and Diane Nakashima, Sea Grant Communications, provided editorial assistance with all aspects of the publication of the book including copy editing, layout and production. This publication is funded by a grant from the National Oceanic and Atmospheric Administration, project #M/PM-2, which is sponsored by the University of Hawaii Sea Grant College Program, SOEST, under Institutional Grant No. NA36RG0507 from NOAA Office of Sea Grant, Department of Commerce. The views expressed herein are those of the author(s) and do not necessarily reflect the views of NOAA or any of its sub-agencies.

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