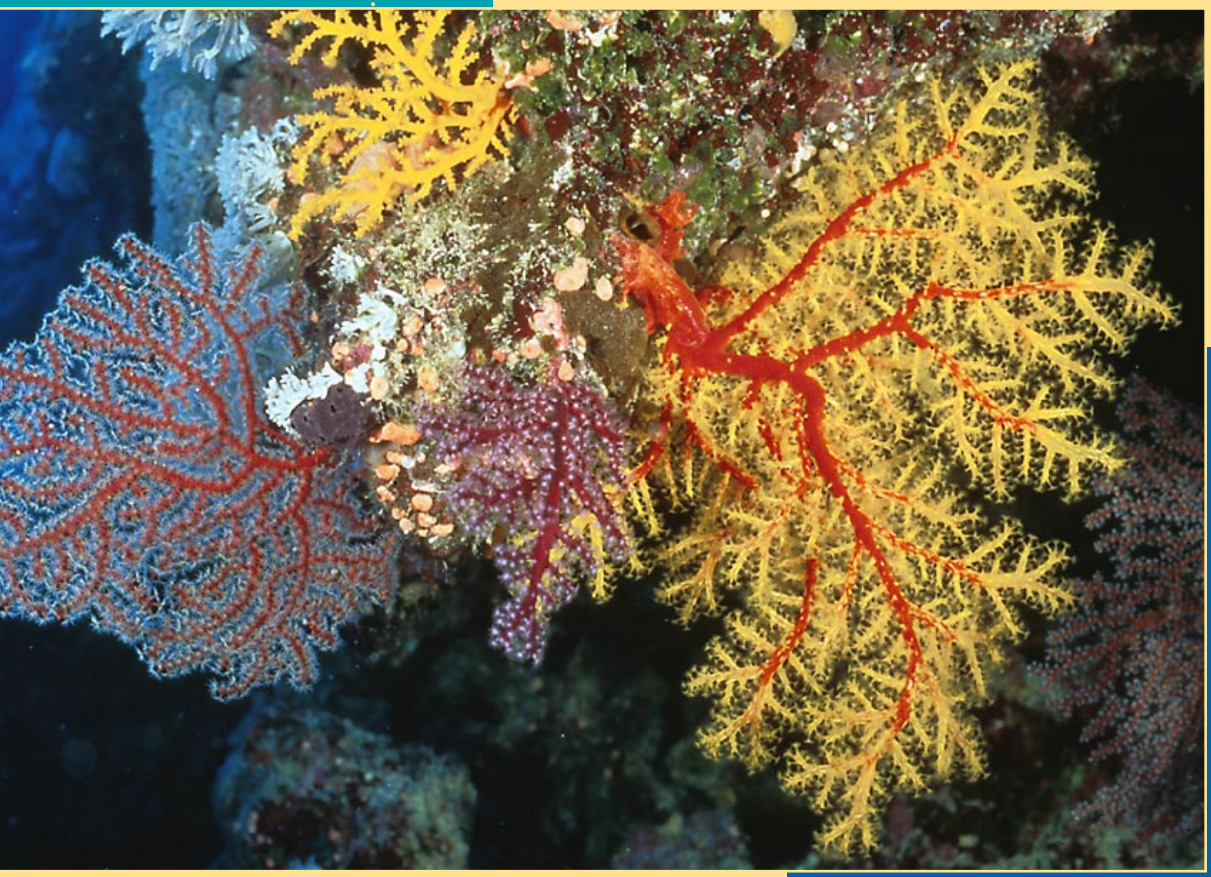
CORAL REEF SURVEY AND MONITORING TRAINING COURSES

Report Series No. 1



National Training Course on Coral Reef Survey and Monitoring Techniques

in Koror, Palau, 4-15 August, 1997

SPREP
South Pacific Regional Environment Programme

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SPREP's Climate Change
and Integrated Coastal
Management Programme

NATIONAL TRAINING COURSE ON CORAL REEF SURVEY AND MONITORING TECHNIQUES

in Koror, Palau, 4-15 August, 1997

Conducted by:

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Produced for the South Pacific Regional Environment Programme (SPREP)

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FOREWORD

Coral reefs are one of the most productive and biologically diverse of all marine ecosystems. They are a valuable resource for tropical coastal communities, providing social and cultural benefits as well as substantial economic benefits through industries such as fishing, tourism and recreation. It is recognised that, globally, coral reefs are becoming increasingly stressed. As much as 10 percent of the earth's coral reefs are significantly degraded and an even greater percentage is threatened (Wilkinson 1993). The major causes of coral reef degradation are typically linked to stresses induced by human activities.

Recognition of the particular problems facing sustainable development of coral reefs has led to the establishment of the International Coral Reef Initiative (ICRI) which aims to maintain the biological diversity, condition, resources and values of coral reefs and related ecosystems. An ICRI Pacific Regional Strategy was developed for the Pacific region in Suva, Fiji in late 1995. The ICRI Pacific Strategy 'Framework For Action' research and monitoring component recognises the need for standardisation and promotes the development of a Global Coral Reef Monitoring Network (GCRMN) under the Coastal Zone Module of the Global Ocean Observing System (GOOS).

The GCRMN is a bottom-up network, newly established in the Pacific region, which aims to improve management and sustainable conservation of coral reefs for people by assessing status and trends in coral reefs and making that information available in a readily understandable format. The GCRMN methods are documented in the *Survey Manual for Tropical Marine Resources* by English et al. (1997). This manual provides a set of methods for reef assessment that can be applied rapidly and efficiently over a wide area by people with different levels of scientific training. The manual contains several basic methods useful for reef assessment including the manta tow technique, the line intercept technique, visual fish census and the measurement of ambient environmental parameters.

SPREP, as the regional coordinating body for environmental issues in the Pacific, in responding to the needs identified by these global and regional initiatives, has organised sub-regional and national coral reef monitoring and assessment training courses in several areas of the Pacific. These courses have received widespread support throughout the region.

The success of these courses is largely due to the experience of the participants in working in the marine environment and their dedication to acquiring new skills. Such initiatives will enhance island nations' capacity to assess, monitor and manage their own coral reef resources. This series of reports summarises the outcomes of the training courses and offers recommendations for future work in this area.

Tamari'i Tutangata

Director, South Pacific Regional Environment Programme

PREFACE

A training course on standard techniques for monitoring coral reefs was undertaken in Koror, Republic of Palau, from 4–15 August 1997. The methods taught were those adopted by a United Nations Environment Programme-International Oceanographic Commission-World Meteorological Organisation-World Conservation Union (UNEP-IOC-WMO-IUCN) Meeting of Experts on a Long Term Global Monitoring System in 1991 (UNEP 1991). The course was designed to train participants from the host nation in the basic methods and skills needed to assess and monitor coral reef resources. As a result of this course seven participants, from a variety of government organisations of the host country, were trained in manta tow and line intercept techniques for the assessment of coral reef benthic communities. This report summarises the training course and offers recommendations for future courses.

Ian Miller from the Long-Term Monitoring Program at the Australian Institute of Marine Science (AIMS) conducted the training at Palau. The AIMS monitoring team helped to design the course work and credit should be given to Valonna Baker, Alistair Cheal, Martin Lourey, Kate Osborne, Will Oxley and Angus Thompson for preparation of course materials, Scott Bainbridge for writing the AIMS Reef Monitoring Data Entry System (ARMDES) software and Will Oxley for project management. Thanks also to staff of the Science Communications Section at AIMS for their assistance.

AIMS is extremely grateful for the time, facilities, organisation and support for this course provided in Palau by the Division of Marine Resources and the Bureau of Natural Resources and Development. The funding for this course was provided by the State Department of the United States through the South Pacific Regional Environment Programme (SPREP).

LIST OF ACRONYMS

AIMS ..... Australian Institute of Marine Science
ARMDES ..... AIMS Reef Monitoring Data Entry System
AusAID ..... Australian Agency for International Development (formerly AIDAB)
COT ..... Crown-of-thorns starfish
CRIOBE–EPHE ..... Centre de Recherches Insulaires et Observatoire de l'environnement
GCRMN ..... Global Coral Reef Monitoring Network
GOOS ..... Global Ocean Observing System
ICRI ..... Intergovernmental Coral Reef Initiative
IOC ..... International Oceanographic Commission
IUCN ..... World Conservation Union
LIT ..... Line Intercept Technique
LTMP ..... Long-Term Monitoring Program
MTT ..... Manta Tow Technique
SCUBA ..... Self-Contained Underwater Breathing Apparatus
UNEP ..... United Nations Environment Programme
UNESCO ..... United Nations Educational, Scientific and Cultural Organization
VCT ..... Visual Census Technique
WMO ..... World Meteorological Organization

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GLOSSARY OF TERMS

Abiotic	non-living
Acroporid / Acropora	category of a dominant form of reef-building coral in the IndoPacific area
Ambient environmental parameters	surrounding characteristics of the site including temperature, salinity, turbidity, light penetration, cloud cover and wind
Anthropogenic	produced or caused by humans
Assemblage	a collection of individuals, usually different types
Baseline study	first assessment of a situation against which subsequent changes are measured
Belt transect	a unit of data collection using transect lines of a fixed width
Benthic communities	groups of organisms living on the sea floor
Biotic	living
Data sheet	a paper form used to record field observations
Dichotomous	divided into two parts
Ecosystem	a dynamic complex of plant, animal, fungal and micro-organism communities and the associated non-living environment interacting as an ecological unit
Foliose	thin and leaf-like
Global Positioning System (GPS)	satellite-based navigation system
Habitat	area where organisms live
Leeward	side protected from the wind
Lifeform	external appearance of organisms resulting from the interaction of genetic and environmental factors
Line intercept transect	used to estimate the sessile benthic community of a specified area of coral reef
Manta tow technique	used to assess broad changes in the benthic communities of coral reefs where the unit of interest is the entire reef, or a large portion thereof
Monitoring	repeated observation of a system, usually to detect change
Non-*Acroporid*/non-*Acropora*	corals not belonging to the *Acropora* family
Population	all individuals of one or more species within a prescribed area
Qualitative	descriptive, non-numerical assessment
Quantitative	numerical, based on counts, measurements or other values
Reef crest	the highest point of the seaward edge of a coral reef
Reef slope	the face of a coral reef extending seawards from the reef crest
Replicate	a repeated sample from the same location and time
Sample	any subset of a population
SCUBA	self-contained underwater breathing apparatus
Soft coral	animal consisting of anemone-like polyps with eight feeding tentacles surrounding mouth
Survey	organised inspection
Transects	a line or narrow belt used to survey the distributions of organisms across a given area
Visual fish census	a method of assessing fish along a transect
Windward	side exposed to the wind

1 INTRODUCTION

Recognising the ongoing need for regional capacity building in coral reef survey methods, SPREP and the State Department of the United States provided funding for a course in reef monitoring techniques for Palau citizens. Palau was chosen because of a previously identified need for the training of Palau as citizens (Otobed 1994) and a strong national commitment to sustainable development as outlined in the National Environmental Management Strategy (Iosefa Maiava and the Bureau of Natural Resources 1994). The course itself was aimed at training citizens from Palau in standard reef monitoring techniques using a similar format to that of the successful course held previously in Papua New Guinea. This report summarises the training course and includes recommendations for future training and development of reef monitoring programmes with particular emphasis on the Republic of Palau.

2 OBJECTIVES

The objectives of the SPREP-sponsored coral reef survey and monitoring course held in Palau were:

(i) to train participants from Palau in the standard methods adopted by UNEP-IOC-WMO-IUCN for assessing coral reef benthic communities;

(ii) to provide participants with a database that conforms to the UNEP-IOC-WMO-IUCN standard and to emphasise the correct methods of data handling, storage and basic data analysis; and

(iii) to give participants a general background in other methods for monitoring coral reefs (ie. reef fish populations) and the relevance of monitoring techniques to reef management.

3 THE TRAINING COURSE

3.1 Requirements of Participants

Prior to the training course, SPREP informed Palau of the prerequisites considered necessary for the participants. These required the trainees to:

(i) be available for long term involvement in the actual gathering of data on the status of coral reefs;

(ii) be relatively fit and qualified to SCUBA dive;

(iii) be in the position to train others in their country;

(iv) have some understanding of computers, particularly Microsoft Windows©; and

(v) be proficient in English.

Although some trainees did not fully reach these requirements (two lacked current SCUBA certification) they were all of a high standard and had some previous experience working in the reef environment.

ANNEX IV COURSE PARTICIPANTS

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ANNEX IV LIST OF PREVIOUS CORAL REEF MONITORING COURSES

Sub-regional

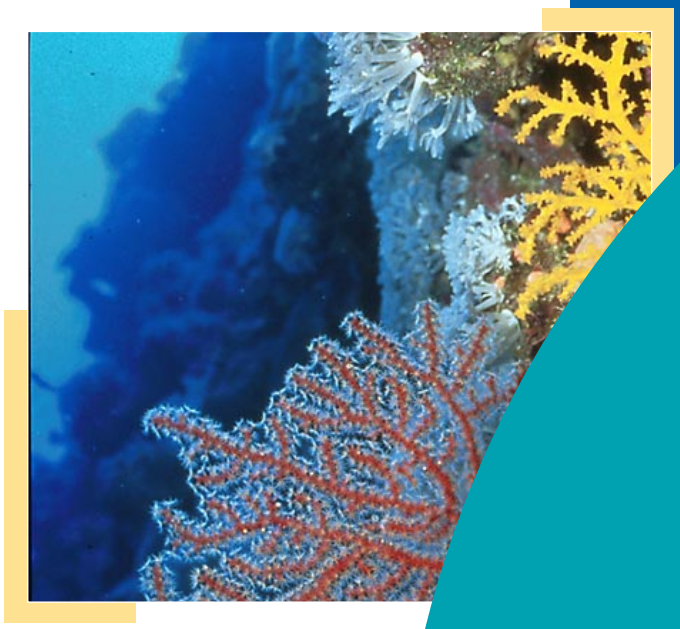
Cook Islands—23 February to 11 March 1994

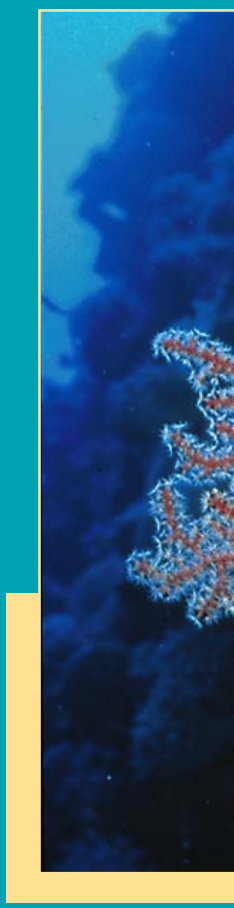
Saipan, Commonwealth of the Northern Mariana Islands—6 to 17 November 1995

National

Port Moresby, Papua New Guinea—February 1996

Palau—4 to 15 August 1997





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