



J.E. Brodie et al:
State of the marine environment
in the South Pacific Region

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PREFACE

The better understanding of the changing problems facing the marine environment is a continuing goal of UNEP's Ocean programme, as it provides the necessary scientific background for shaping UNEP's policy towards the protection of the oceans.

The main sources of factual information used in the assessment of the state of the marine environment are data published in open scientific literature, data available in various reports published as "grey literature" and data generated through numerous research and monitoring programmes sponsored by UNEP and other organizations.

Several procedures are used to evaluate critically the large amount of available data and to prepare consolidated site-specific or contaminant-specific reviews.

GESAMP, the IMO/FAO/Unesco/WMO/WHO/IAEA/UN/UNEP Joint Group of Experts on Scientific Aspects of Marine Pollution, is charged by its sponsoring bodies with preparation of global reviews. Reviews dealing with several contaminants have been already published by GESAMP and others are being prepared for publication. The first global review on the state of the marine environment was also published by GESAMP in 1982, and the second global review was published in 1990.^{1/}

In parallel with the preparation of global assessments, the preparation of a series of regional assessments, following the general format of the second global review by GESAMP, was initiated by UNEP in 1986, with co-operation of the Food and Agriculture Organization of the United Nations (FAO) and the Intergovernmental Oceanographic Commission of Unesco (IOC). Fifteen task teams of scientists were set up, involving primarily experts from the relevant regions, to prepare the regional reports under the joint overall co-ordination of UNEP, FAO and IOC, and with the collaboration of a number of other organizations.

The present document is the product of the Task Team for the South Pacific Region. The final text of the report was prepared by J.E. Brodie, as Rapporteur of the Task Team for the South Pacific Region, with collaboration of C. Arnould, L. Eldredge, L. Hammond, P. Holthus, D. Mowbray and P. Tortell, whose contributions are gratefully acknowledged.

^{1/} Publications of GESAMP are available from the organizations sponsoring GESAMP.

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TABLE OF CONTENTS

	Page
1. INTRODUCTION	1
1.1 Aims	1
1.2 Geographic coverage	1
2. CHARACTERISTICS OF THE REGION	1
3. MARINE CONTAMINANTS: LEVELS AND DISTRIBUTION	4
3.1 Concentrations in water, sediment and biota	4
3.2 Transport and fluxes across boundaries	11
3.3 Data validation and management	12
4. HUMAN ACTIVITIES AFFECTING THE SEA	13
4.1 Disposal of urban and industrial wastewaters	13
4.2 Development of coastal areas	14
4.3 Manipulation of hydrological cycles	15
4.4 Other land use practices	16
4.5 Disposal of contaminated sediments, mine tailings and industrial solid wastes	16
4.6 Disposal of solid matter	18
4.7 Marine transport of oil and other hazardous substances	18
4.8 Exploitation of non-living marine resources	19
4.9 Exploitation of living marine resources	19
5. BIOLOGICAL EFFECTS	22
5.1 Eutrophication and associated phenomenon	22
5.2 Public health effects	23
5.3 Long-term impacts	24
5.4 Damaged habitats and resources and their potential for recovery and rehabilitation	25
5.5 Accidents and episodic events	27
6. PREVENTION AND CONTROL STRATEGIES	28

	Page
7. TRENDS AND FORECASTS	29
8. ECONOMICS	30
9. SUMMARY AND CONCLUSIONS	31
10. REFERENCES	32
APPENDIX 1 - ACRONYMS	56
APPENDIX 2 - ADDRESSES OF CONTRIBUTING AUTHORS	58

1. INTRODUCTION

1.1 Aims

This report is one of a considerable number prepared in different regions of the earth. The preparation of these reports was initiated by the United Nations Environment Programme (UNEP) and the Intergovernmental Oceanographic Commission (IOC) of UNESCO as contributions to the Group of Experts on the Scientific Aspects of Marine Pollution (GESAMP) review of the state of the marine environment. During their preparation, however, they have developed further into independent publications completely reviewing the state of the marine environment in the region concerned. The South Pacific report has aimed at reviewing knowledge of the marine environment in the subject areas specified by GESAMP Working Group 26 (responsible for the global review) with particular focus on the period from 1980 to 1989.

1.2 Geographic coverage

The region covered by this report includes the ocean and coastal areas associated with the states belonging to the South Pacific Regional Environment Programme (SPREP). SPREP is one of the UNEP regional seas and is in the area 25° N to 45° S and 130° W to 120° E. The region incorporates the small island states and territories of the central and western Pacific Ocean (Fig. 1). An Action Plan for the region is implemented through the South Pacific Regional Environment Programme (SPREP) and includes 25 states or territories. These are American Samoa (USA), Australia, Commonwealth of the Northern Marianas (USA), Cook Islands, Federated States of Micronesia, Fiji, French Polynesia (France), Guam (USA), Kiribati, Nauru, New Caledonia (France), New Zealand, Niue, Norfolk Island (Australia), Papua New Guinea, Pitcairn Island (United Kingdom), Republic of Marshall Islands, Republic of Palau, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu, Wallis & Futuna (France), and Western Samoa. In the case of territories the responsible state is shown in brackets.

Most of the members are of small land area and, with few exceptions, low population. However, since most of them consist of scattered islands they claim huge exclusive economic zones e.g. Kiribati with a land area of 690 km² and an EEZ area of 3.5 million km². The combined EEZ areas of the member states cover most of the western, central and south Pacific Ocean. Many of them are poor in terrestrial natural resources and look to marine resources for their prosperity. In the atoll countries (Tuvalu, Kiribati, Marshall Islands and parts of others) over 90% of protein requirements traditionally come from the sea (Johannes, 1977). Most of the island states and the northern half of Australia share a coastline type which has a mixture of mangroves, seagrass beds and coral reefs.

2. CHARACTERISTICS OF THE REGION

The region covered in this review varies from equatorial to the cold temperate conditions of the southern parts of New Zealand and Tasmania and has seas bordering the continental influence of Australia to those parts of the world's oceans furthest removed from continental effects viz. the mid-Pacific. The states of the region vary from the very large (Australia) to the very small (e.g. Nauru and Tuvalu). Very little can be said that is of general applicability with respect to ocean currents, winds and climatic conditions for such a vast region. Many of the island groups and the northern Australian coast are affected by consistent winds, particularly the South-East trades while also being regularly subjected to cyclones. The parts of the region close to the equator often have a monsoonal rainfall pattern while those south of about 25° S are influenced by the succession of eastward moving anti-cyclones. The entire region is periodically disturbed by

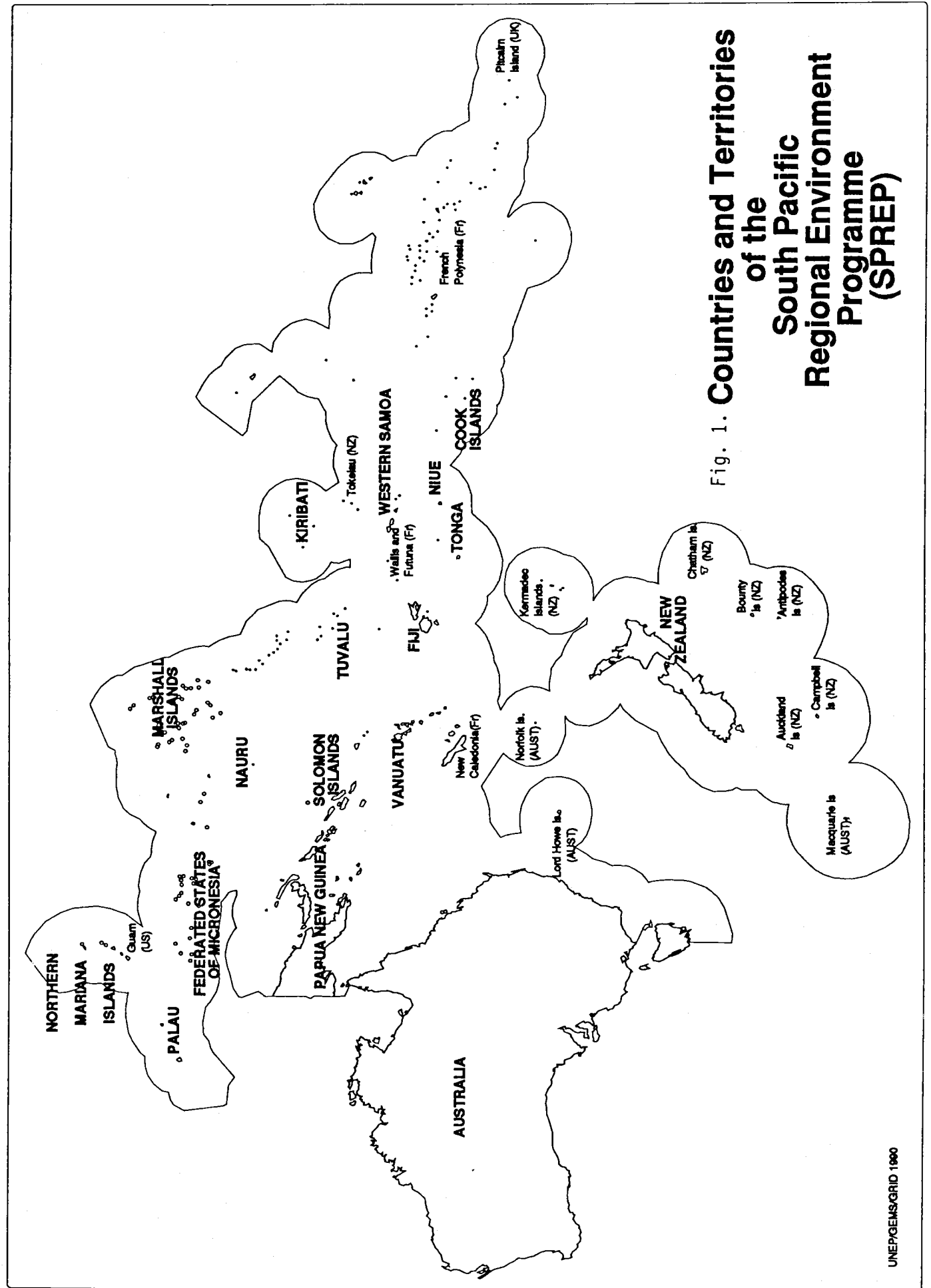


Fig. 1. Countries and Territories of the South Pacific Regional Environment Programme (SPREP)

the El Nino - Southern Oscillation phenomenon which can have profound effects on marine life in the Pacific (Barber & Chavez, 1983). As already mentioned most of the island states have small land areas but huge EEZ areas. These same island groups and northern Australia possess over half the world's coral reefs as well as considerable coastal areas of mangroves and seagrass beds. The coastal areas of New Zealand and southern Australia include rocky shores, sandy beaches, large coastal lagoons and the deep fiords of south western New Zealand.

At present programmes to monitor the health of the oceans in the region are of limited extent and facilities of limited capability. The member states fall into two distinct groups, those which have the facilities, personnel, expertise and funding available to mount a comprehensive long term monitoring programme (Australia, New Zealand, Guam, French Polynesia and New Caledonia) although they may not be doing so at present and the others which do not have this capacity at present. Even more obvious is the distinction in terms of development between Australia and New Zealand on one hand and the 'small island states' on the other. For convenience the discussion in this review will often treat these two groups separately. Papua New Guinea and Fiji have University research institutions which carry out limited monitoring often supported by SPREP. The Institute of Natural Resources at the University of the South Pacific in Fiji has also begun, in 1987 a programme of coastal water monitoring in selected areas of Kiribati, Tonga, Vanuatu and the Solomon Islands supported by SPREP and in association with government departments in each state but this is of limited extent at present. The French research institutions ORSTOM and LESE have well equipped laboratories and are well staffed but neither New Caledonia nor French Polynesia have regular monitoring programmes although considerable work has been done around Papeete. As a consequence of limited monitoring the hard data available for a review on the state of the marine environment is scant. Only Guam, with both its university (UOG) and well supported Environmental Protection Agency (GEPA), and some areas in Australia, New Zealand and French Polynesia have ongoing continuous marine monitoring programmes generating data which could possibly be used to detect long term changes. The University of Guam's Water and Energy Research Institute (WERI) also carries out monitoring programmes in Micronesia but these have been mainly confined to construction environmental impact assessment (Zolan et al, 1982; Clayshulte & Zolan, 1982; Clayshulte, 1983; Zolan, 1983). Projects in the rest of the region are highly localized and normally 'one off' so long term effects cannot be evaluated. Thus the data which the South Pacific region can contribute to the global review will be of a very limited nature. Much of the work and data from Australia is based on state level activity and, although uncoordinated, the amount of data available is far greater than for the other SPREP members. For this reason Australia will often be treated separately in many sections of the report.

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