



SPREP

South Pacific Regional Environment Programme

*Report
of the
Fourth SPREP
Meeting of
Meteorological Service
Directors (RMSD)*

*Apia, Samoa
8–10 July 1997*

SPREP Library Cataloguing-in-Publication Data

SPREP Meeting of Regional Meteorological Service Directors
(4th : 1998 : Apia, Samoa)

Fourth SPREP Meeting of Regional Meteorological Service Directors
(RMSD), Apia, Samoa, 8-10 July, 1997. - Apia, Samoa : SPREP, 1998.

ii, 21 p. ; 29 cm

ISBN: 982-04-0190-9

1. Meteorologists – Oceania. 2. Meteorology – Oceania. I. South Pacific
Regional Environment Programme.

551.5092099

Published in 1998 by the
South Pacific Regional Environment Programme
PO Box 240
Apia, Samoa
Email: sprep@sprep.org.ws
Website: <http://www.sprep.org.ws>

Produced by SPREP's Climate Change and Integrated Coastal
Management Programme

Edited and layout by SPREP's Publication Unit

Typeset in 11/14 Garamond and Helvetica
Printed on recycled paper 90gsm Savannah Matt Art (60%) by
Commercial Printers Ltd
Apia, Samoa

© **South Pacific Regional Environment Programme, 1998.**

The South Pacific Regional Environment Programme
authorises the reproduction of this material, whole or in
part, in any form provided appropriate
acknowledgement is given.

Original Text: English

SPREP's Climate Change
and Integrated Coastal
Management Programme

Report
of the
Fourth SPREP
Meeting of
Meteorological Service
Directors (RMSD)

Apia, Samoa
8–10 July 1997



Published by the
South Pacific Regional Environment Programme

CONTENTS

Executive Summary and Recommendations	v
Report of the Meeting	1
Introduction	1
Opening Session	1
Review of Conclusions and Recommendations from the Third RMSD	1
National and Regional Coordination— Review of Current National and Regional Meteorological and Climate Activities	2
International Activities in Support of Regional Meteorological and Climate Programmes	4
Other Issues	4
Annexes	
Annex I Participants List	6
Annex II Opening Statement by Director of SPREP	12
Annex III Country Reports	
<i>American Samoa</i>	14
<i>Australia</i>	14
<i>Cook Islands</i>	14
<i>Federated States of Micronesia</i>	15
<i>Fiji</i>	16
<i>French Polynesia</i>	16
<i>Republic of Kiribati</i>	16
<i>Republic of the Marshall Islands</i>	16
<i>New Caledonia</i>	17
<i>New Zealand</i>	17
<i>Niue</i>	17
<i>Republic of Palau</i>	17
<i>Papua New Guinea</i>	17
<i>Samoa</i>	18
<i>Solomon Islands</i>	18
<i>Tonga</i>	18
<i>United States of America</i>	20
<i>Vanuatu</i>	20
<i>Wallis and Futuna</i>	20
Annex IV Long Term Planning and Regional Cooperation	21

EXECUTIVE SUMMARY AND RECOMMENDATIONS

Having met in Apia, Samoa, from 10 July 1997, participants of the Fourth SPREP Meeting of Regional Meteorological Service Directors (RMSD) have agreed on the following specific summary and recommendations which are directed toward government decision-makers and relevant organisations.

1. Participants of the Fourth SPREP Meeting of Regional Meteorological Service Directors noted with satisfaction that appropriate follow up actions were taken by the SPREP Secretariat to implement recommendations of the Third SPREP Meeting of Regional Meteorological Service Directors. The meeting requested that the SPREP Secretariat continue its efforts in implementing those matters that are still outstanding.

2. The meeting welcomed the convening of the second and third meetings of the SPREP Working Group on Climate (WGC), endorsed the reports and action statements of this group, and called for prompt action in addressing these calls for action. Considerable concerns were expressed by some participants on the role and function of this working group in relation to the RMSD meeting. The meeting recognised the different role played by the WGC after clarification by the Secretariat. The meeting endorsed the draft terms of reference to guide future work of this working group as proposed by the Third Meeting of the WGC. The meeting noted that some members of this working group are also members of the World Meteorological Organization (WMO) Regional Association Five (RA V) Working Group on Climate Matters. The meeting recognised the importance of establishing a close working relationship between the two working groups.

3. The meeting noted the progress report on the SPREP Climate Change programme. It welcomed the expansion of the programme and urged National Meteorological Services (NMS) to work closely with SPREP in its implementation.

4. The meeting noted with appreciation the progress report tabled by the newly appointed Project Manager of the Pacific Islands Climate Change Assistance Programme (PICCAP). It noted with appreciation the appointments of PICCAP's Project Officers and wished them success in their new positions. In view of the need for resources to support the implementation of SPREP's Climate Change programme, the meeting strongly recommended that meteorological services of the region continue to provide guidance and advice to relevant national and regional agencies and organisations, to ensure the successful implementation of the Pacific Islands Climate Change Assistance Programme and for the best possible outputs to be achieved.

5. The meeting noted the progress report presented by the SPREP Secretariat on the status of the on-going climate change negotiations. It urged NMSs to continue to provide advice to their respective governments in the on-going climate negotiations. The meeting urged participants to pay closer attention to these negotiations.

6. The meeting noted with satisfaction the progress national reports on meteorological and climatological activities in each SPREP member country. Many valuable experiences and lessons were identified.

7. The meeting welcomed the commencement of the European Union (EU) funded Cyclone Warning System Upgrade Project which will provide further assistance to strengthening National Meteorological Services of participating countries. The participants recognised the need for this project to work closely with SPREP and WMO. All countries who are participating in the project were urged to identify their needs for training, equipment and technical advice and submit these to the Project Coordinator for consideration.

8. The meeting noted with appreciation the appropriate follow up actions taken by the SPREP Secretariat and WMO in implementing the satellite receiving equipment project, which has resulted in improved efficiencies in the operation of forecast and warning systems. Concerns were expressed by some

participants about the lack of on-going maintenance and training in the use of the system. The participants recommended that these matters be addressed with urgency. The meeting further recommended that adequate backup support and training is provided in the future given the importance of the equipment to their day to day operations. The meeting requested SPREP to consider the provision of adequate training and maintenance support for these systems for the foreseeable future.

9. The meeting noted with interest the presentation relating to the Emergency Manager's Weather Information Network (EMWIN) system being developed by the United States National Weather Service (USNWS). The meeting strongly endorsed the system as it is seen to be a very useful and valuable form of communication especially during periods of severe weather such as tropical cyclone where existing commercial links may be unavailable. In this context, it was seen as a useful initiative for further consideration by SPREP and the EU Cyclone Warning Upgrade project. The meeting requested both these parties to follow up with the USNWS with a view to reaching agreement with them to include appropriate data for Pacific island countries (PICs) through EMWIN transmission on GOES-W satellite. Provided agreement is reached with the USNWS, the meeting recommended that EMWIN be adopted as an emergency data and warning link into the PICs.

10. The meeting reaffirmed the recommendation of the Third Meeting of RMSD that a regional climate monitoring and outlook bulletin be produced in the region. The meeting again welcomed the offer by the Fiji Meteorological Service to host the production of the bulletin. The meeting welcomed the feasibility study report commissioned by SPREP on the matter and encouraged the Fiji Meteorological Service to start production of the bulletin as soon as possible, even if it is initially on a basic trial basis, and further urged that all NMSs contribute and cooperate as may be required. The meeting recommended that SPREP seek donor support for the three components of the project as set out in the feasibility study report in consultation with the WMO's Climate Information and Prediction Service (CLIPS) office. Furthermore, the meeting requested SPREP to secure enough funds so that a French version of the bulletin is produced.

11. The meeting re-affirmed the recommendation by the Third Meeting of RMSD of the importance of climate data, data management and especially CLICOM support in strengthening climate programmes of NMSs. The meeting welcomed the project design document commissioned by SPREP titled Climate Data Resources for Environment and Sustainable Development (CDRES D) to address this matter. The meeting strongly recommended National Meteorological Services and SPREP to urgently consider and, as appropriate, revise the CDRES D project document and promote the project with potential donors with a view to an early commitment and commencement of the project. The meeting also endorsed the urgent need for on-going training and support for CLICOM, data management and data application. The meeting urged SPREP to explore ways to meet the needs of US affiliated Pacific islands for climate data services that are appropriate to their established relationship.

12. The meeting noted the high impact of El Nino Southern Oscillation (ENSO) on Pacific island environments and economies and the emergence of a growing scientific capability to predict ENSO and seasonal climate. The meeting further noted the multinational initiative led by the United States National Oceanic and Atmospheric Administration (NOAA) to develop a multilateral institute, the International Research Institute (IRI) for climate prediction to develop ENSO climate forecasting and applications. The meeting strongly recommended that SPREP entered into discussions with NOAA and IRI partners with a view to the early formal involvement of the Pacific islands in supporting the IRI and gaining access to its services, as climate prediction is one important means by which meteorological services can show the considerable value of their work to leaders, policy makers and the public in their respective countries. The meeting noted with satisfaction that the WMO CLIPS project office and IRI have entered into discussion to cooperate in implementing these respective programmes.

13. The meeting noted with satisfaction the continuation of the close and cooperative working arrangements between SPREP and WMO. The meeting welcomed the significant progress made regarding the setting up of the WMO Sub-regional Office for the South West Pacific within SPREP. The

meeting urged SPREP, WMO and the Government of Samoa to finalise negotiations so that the Sub-regional Office is operational as soon as possible.

14. The meeting noted the Netherlands funded project titled Capacity Building in the Area of Management of National Meteorological and Hydrological Services (NMHSs) to be implemented by WMO which will be piloted in the Pacific region. Concerns were raised by the meeting regarding the absence of a consultant from the Pacific region within the team of consultants for the project. The meeting requested WMO to consider having an expert from the developing countries in the Pacific as a member of the team.

15. The meeting noted that a number of Pacific meteorological services in the region either had recently undergone or were facing significant organisational changes. The meeting expressed concern that these changes have the potential to reduce the amount of weather and climate information collected and or exchanged, and urged that every effort be made to avoid such reductions.

16. The meeting noted that the imminent closure of the Omega navigation system will definitely result in the closure of some upper air station in the region unless steps are taken to upgrade these stations for GPS radiosonde use. The meeting requested SPREP and WMO to make urgent inquiries to identify funding sources for the necessary upgrades required to keep these stations in place to support the WMO World Weather Watch (WWW) programme. Concern was also expressed about the loss of surface and upper air station resulting from funding and personnel reductions in National Meteorological Services.

17. The meeting noted with satisfaction the activities and programmes of the Nadi Regional Specialised Meteorological Centre (RSMC) - Tropical Cyclone Centre (TCC), as specified by the operation plan of WMO RA V Tropical Cyclone Committee for the South West Pacific and the South East Indian Ocean, and further noted that small island countries within Nadi's area of responsibility rely on Fiji to continue providing free and unrestricted data and products in accordance with WMO (CGXII) Resolution 40. In this connection, the meeting expressed its appreciation for all countries of the region in keeping with the spirit of this resolution.

18. The meeting reiterated the recommendation from the Third Meeting of the SPREP WGC of the many valuable accomplishments of the Pacific ENSO Application Center (PEAC). The participants noted with appreciation the US Government's extended support to PEAC. The meeting urged SPREP to work with PEAC and other partners for continued cooperation with regional efforts to establish similar services for the Pacific region at large, and in particular, to assist the region by sharing relevant research results and experimental climate forecasts.

19. The meeting noted with appreciation the presentation by Mr Anthony Barnston of the US NOAA Climate Prediction Center on their draft atlas titled *A Precipitation Climatology at Tropical Pacific Island Stations: Effects of ENSO*. The meeting commended the atlas to all interested parties in the climate of the region and urged members to provide Mr Barnston with additional monthly rainfall data from 1955 to 1996, if available, as soon as possible for inclusion in the atlas. Comments and suggestions about the atlas are requested.

20. The meeting noted with appreciation the progress report provided by Dr Bill Clements on the present status of implementation of the US Department of Energy (DOE) Atmospheric Radiation Measurement (ARM) Program in the Tropical Western Pacific. It further noted the valuable contribution this project has for the region and internationally on data collection and urges the US Government to continue its support to this programme. The meeting also recommended that the ARM program and relevant countries involved worked together to ensure that operational meteorological data be made available to interested parties in real time.

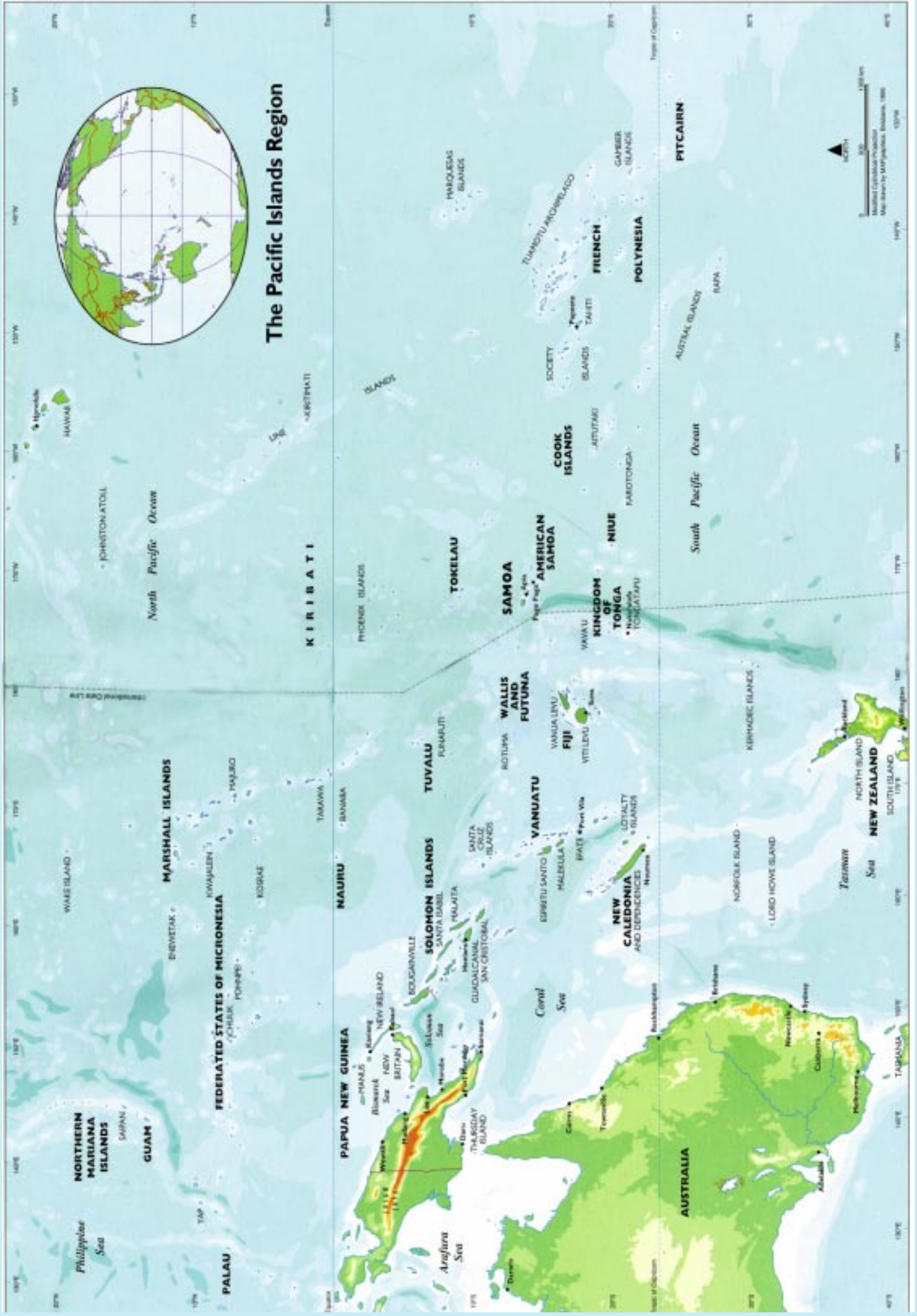
21. The meeting noted the progress report prepared by the SPREP Secretariat on its future planned activities including the proposed fixed agenda prepared by the Secretariat for this RMS Directors' meeting. The meeting endorsed the future planned activities of the Secretariat as well as the fixed agenda with some modifications.

22. The participants considered the suggestion put forward by the Secretariat for the meeting to be held every two years instead of the present annual arrangement in view of the costs involved and to

allow adequate time to implement the range of recommendations proposed by the meeting. The participants, however, agreed to keep the present annual meeting arrangement. In order to share costs and because of important matters which have to be discussed in 1998, the participants urged SPREP to

explore the possibility of hosting this meeting in 1998 jointly either with WMO, the EU Cyclone Warning System Upgrade Project, and/or other interested parties. At the 1998 meeting, the issue of biennial meetings will then be reconsidered bearing in mind the concerns of the Secretariat and this meeting.

The Pacific Islands Region



REPORT OF THE MEETING

INTRODUCTION

The Fourth SPREP Meeting of Regional Meteorological Service Directors (RMSD) was convened in Apia, Samoa, from 8–10 July 1997. The meeting follows the Third Meeting of RMSD which was also held in Apia, from the 14–16 November 1995. The meeting was funded by the Republic of China (Taiwan) with assistance from the US Department of Energy's Atmospheric Radiation Measurement (ARM) Program, the New Zealand Meteorological Services Ltd and the Vaisala Pty Ltd.

The objectives of the meeting were to:

- review progress made since the 1995 SPREP Meeting of Regional Meteorological Service Directors (RMSD) towards strengthening regional cooperation in climate monitoring and climate data services
- review on-going activities in support of regional climate programmers
- formulate and develop strategies for securing long-term regional coordination in climate services
- discuss the working relationship between organisations working on meteorological and climate matters in the region
- assist the SPREP Secretariat in further developing its climate change programme, particularly in the meteorological and climate sectors.

OPENING SESSION

The Hon. Minister of Agriculture, Fisheries, Forests and Meteorological Service of Samoa, Mr Molio'o Teofilo delivered the welcoming address on behalf of the Government of Samoa. The Hon. Minister welcomed delegates to Samoa and stated that it was a historic time in Samoa as the Government and the people of Samoa had just accepted the name change for the country from "Western Samoa" to "Samoa." He noted the very important role the National Meteorological Services (NMSs) plays to safeguard the welfare of the people. He wished the participants a successful and enjoyable stay in Apia.

The Director of SPREP, Mr Tamari'i Tutangata, welcomed delegates to the meeting. He called upon delegates to find ways to strengthen regional coordination in meteorological and climate activities. Mr Tutangata also stressed the importance of the meeting in providing direction and guidance to the SPREP Secretariat on future climate and meteorological activities. Mr Tutangata's speech is attached as Annex II.

The Director of the World Meteorological Organization (WMO) Regional Office for Asia and the South West Pacific, Mr Eisa Al-Majed, spoke on behalf of Prof. Obassi, Secretary General of WMO. Mr Al-Majed thanked the meeting for inviting him and looked forward to further working with the region. He outlined the current and planned activities of WMO particularly in relation to the Regional Association Five region (RA V). He briefed the meeting on the outcome of WMO's 49th Executive Council Meeting.

The Director of American Samoa's Meteorological Service nominated the Director of Samoa's Meteorological Service to Chair the meeting. This was seconded by the delegate from the Solomon Islands. Vanuatu was nominated by the Cook Islands as Co-Chair. As there were no other nominations Mr Fa'atoia Malele, Acting Director of the Samoa Meteorological Service and Superintendent of the Apia Observatory was elected Chairman and Mr Henry Taiki, Director of Vanuatu Meteorological Services was elected Co-Chair.

The provisional agenda was tabled by the chairman. With a few amendments the revised agenda was adopted.

REVIEW OF CONCLUSIONS AND RECOMMENDATIONS FROM THE THIRD RMSD

The meeting began with a review of activities arising from the Third SPREP Meeting of Regional Meteorological Service Directors held in Apia from 14–16 November 1995. An interim report prepared by the SPREP Secretariat and presented to the meeting for their consideration was used as a guide for discussion. In reviewing the progress report, the participants welcomed the

report and thanked the Secretariat for the significant progress made in implementing the recommendations. The meeting urged the Secretariat to continue its efforts to implement other recommendations still outstanding particularly in relation to technical projects.

The Chairman of the SPREP Working Group on Climate (WGC) Mr Arona Ngari, Director of the Cook Islands Meteorological Service, presented the action statements arising from the third meeting of the WGC held in Rarotonga, Cook Islands from the 11–13 May, 1997. Concerns were expressed by some delegates regarding the work of the WGC who asked for clarification from the Secretariat. In responding, the Secretariat reminded the meeting that the WGC was established by the Secretariat to fulfill one of the recommendations from the second SPREP meeting of RMSD held in 1995, to establish a working group that will assist the Secretariat in identifying areas where national, regional and international programmes are implemented successfully in the region. The Secretariat referred the meeting to the draft Terms of Reference (TOR) put forward by the WGC at its second meeting in Nadi, Fiji in 1996, the TORs explain the role and functions of the WGC. The meeting was asked to consider the draft Terms of Reference in order to define the role of the WGC. The meeting endorsed the draft TOR and urged the WGC to continue its work in assisting the Secretariat. The meeting noted that some members of the SPREP WGC are also members of the WMO RAV Working Group on climate matters. Given the similarity in the role and functions of the two working groups, the meeting urged that a close working relationship between the two working groups be established to ensure maximum benefit to both organisations.

The meeting reviewed the progress report prepared by the SPREP Secretariat and WMO on matters arising from the 49th Executive Council of WMO, held in Geneva from the 10–20 June, 1997. Mr Al-Majed briefed the meeting on matters that directly affect members of WMO in RA V. He updated the meeting on the current status of the setting up of the WMO Sub-regional Office for the South West Pacific within the SPREP Secretariat and the RA V programme of planned activities. On the WMO Sub-regional Office,

Mr Al-Majed stated that negotiations on the agreement to establish the office between WMO, SPREP and the Government of Samoa had already begun and looked forward to finalising it soon. Mr Al-Majed also informed the meeting of the approved budget for the WMO Secretariat 1997–1999. He referred the meeting to agreed resolutions that came out of the EC meeting which detailed matters that would directly affect RA V and South West Pacific programmes. The Secretariat in referring to this Agenda Item, informed the meeting about gifts for the new WMO headquarters which will open in 1999. In referring to this Agenda Item, the SPREP Secretariat noted the paper circulated at the Council meeting that only Australia from the South West Pacific has offered a gift for the new headquarters. The Secretariat urged Pacific island country members of WMO to donate gifts to the WMO headquarters.

NATIONAL AND REGIONAL COORDINATION— REVIEW OF CURRENT NATIONAL AND REGIONAL METEOROLOGICAL AND CLIMATE ACTIVITIES

The session of this Agenda Item began with an overview of the role and functions of the Fiji Meteorological Service (FMS). Mr Rajendra Prasad, Director of FMS briefed the meeting on the roles and responsibilities of FMS as the Regional Specialised Meteorological Centre (RSMC) for the South West Pacific. A detailed report prepared by Mr Prasad was presented to the meeting. In his presentation, Mr Prasad told the meeting that the Nadi Centre is the most recently designated RSMC for tropical cyclones, having recently been approved by the 47th session of the WMO Executive Council held in Geneva in June 1996. The RSMC is incorporated within the Weather Forecasting Division of FMS, a department operating under the Fiji Government since 1976. Mr Prasad then briefed the meeting on a major review of the roles and functions of FMS currently conducted by the New Zealand Meteorological Services Ltd for the Fiji Government. The review report has been completed and is now with the Fiji government for consideration.

The SPREP Secretariat updated the meeting on SPREP's Climate Change programme and its

planned activities. It advised the meeting of recent changes taking place within the SPREP Climate Change programme particularly in relation to the increase in the number of project staff in the near future. The Secretariat noted that by the beginning of 1998, the SPREP Climate Change programme would be the biggest programme within SPREP made up of six project officers, with the inclusion of the WMO Sub-regional Office Resident Representative. The SPREP Secretariat is looking forward to the establishment of the WMO Sub-regional Office within SPREP. The meeting was then briefed by Mr Wayne King, the newly appointed Project Manager of the Pacific Islands Climate Change Assistance Programme (PICCAP), on planned PICCAP activities. The meeting thanked the SPREP Secretariat for the update and looked forward to working with the Secretariat in assisting the NMSs.

In recognising the importance of the advisory technical roles provided by meteorological offices to their respective governments on the on-going climate change negotiations, the Secretariat prepared a progress report updating the meeting on the latest status of the negotiations. The meeting took note of the progress report and urged NMS to continue to provide advice to respective governments in these on-going negotiations. The meeting urged participants to pay close attention to the negotiations particularly in the lead up to the third conference of the parties to the Convention (COP3) to be held in Kyoto, Japan in December 1997.

The meeting then focused on national reports from other SPREP member countries. American Samoa was the first to update the meeting on the status of its meteorological services, Australia followed and so on. Progress reports from countries that provided reports to the Secretariat are attached as Annex III to this report. The meeting noted with satisfaction the national progress reports on meteorological and climate activities. The participants noted that many of the valuable experiences and lessons learned were similar among the countries.

The meeting was briefed by Mr Neville Koop, Project Coordinator of the newly established EU Cyclone Warning System Upgrade Project, about the objective of the project. The meeting

welcomed the commencement of this project. The meeting recognised that this project will provide further assistance to strengthening National meteorological Services for participating countries. The participants unanimously agreed that this project must complement existing regional projects and recognised the need for the project to work closely with SPREP and WMO. The meeting urged that all participating countries should identify their training, equipment and technical advice, and submit these to the Project Coordinator for consideration.

The next session began with a briefing by Mr Collin Schulz, Telecommunication Engineer and Consultant to SPREP on the progress report on implementation of the WMO/SPREP Low Resolution Satellite Equipment project initiated in 1995. Mr Schulz informed the meeting that four countries (Samoa, Fiji, Kiribati and Tonga) have already benefited from the project and another four countries (Niue, Vanuatu, Papua New Guinea, and Federated States of Micronesia) will receive the system in the second phase of the project proposed for implementation in the second half of 1997. The meeting noted with appreciation the follow up actions taken by the SPREP Secretariat and WMO in implementing this project which has resulted in improved efficiencies in the operation of forecasts and warning system in Pacific island countries. Some participants expressed concerns about the lack of on-going maintenance and training in the use of the system and recommended these matters be addressed with urgency. Participants further recommended that adequate backup support and training be provided in the future given the importance of the equipment to their day to day operation. The meeting requested SPREP to consider the provision of adequate training and maintenance support for these systems in the future.

The meeting considered progress made towards a Pacific islands regional Climate Bulletin proposal. Dr Reid Basher, of the NZ National Institute of Water and Atmosphere (NIWA), introduced the proposal. In his briefing, he mentioned that the bulletin was conceived out of recommendations from the third RMSD. Dr Basher informed the meeting that the proposal had already been finalised and is now under consideration by the SPREP Secretariat. The meeting endorsed the

proposal and welcomed the offer by the Fiji Meteorological Service to host the production of the bulletin. The meeting urged the FMS to start production of the bulletin as soon as possible, even if initially, it is on a trial basis. The meeting urged all NMS to contribute and cooperate as may be required towards the production of the bulletin. The participants urged SPREP to seek donor support for the three components of the project as set out in the feasibility study report in consultation with WMO's CLIPS office. The meeting also urged SPREP to secure funding for a French version of the bulletin to be published.

INTERNATIONAL ACTIVITIES IN SUPPORT OF REGIONAL METEOROLOGICAL AND CLIMATE PROGRAMMES

SPREP and WMO presented information to the meeting of the outcomes of the 49th Executive Council Meeting held in Geneva, in June 1997, particularly those items that are relevant to the South West Pacific. The meeting was updated on the progress of establishing the WMO Sub-regional Office for the South West Pacific within SPREP.

The meeting noted with satisfaction the continuation of the close working arrangements between SPREP and WMO. The meeting welcomed the significant progress made regarding the setting up of the WMO Sub-regional Office for the South West Pacific within SPREP. The meeting urged SPREP, WMO and the Government of Samoa to finalise negotiations so that the Sub-regional Office is operational as soon as possible.

The meeting considered problems arising from the closure of the Omega navigation system. The meeting noted that the imminent closure of this system may result in the closure of some upper air station in the region unless steps are taken to upgrade these stations for GPS radiosonde use. The meeting requested SPREP and WMO to make urgent inquiries to identify funding sources for the necessary upgrades required to keep these stations in place to support the WMO World Weather Watch (WWW) program. Concerns were also expressed by some participants about the loss of surface and upper air station resulting from

funding and personnel reductions in National Meteorological Services.

There was discussion on the Netherland's funded project titled *Capacity Building in the Area of Management of National Meteorological and Hydrological Services* to be implemented by WMO in the Pacific region. The meeting noted the project.

Concerns were raised by the meeting regarding the absence of a consultant from the Pacific region in the team of consultants appointed for the project. The meeting requested WMO to consider having an expert from the developing countries in the Pacific as a member of the team.

The meeting then discussed the progress report on WMO's Climate Information and Prediction Services project in the Pacific region. Dr Reid Basher, consultant to SPREP who undertook a review of the CLIPS project since its establishment in 1995, noted that PICs stand to gain a good deal from the CLIPS project especially since ENSO fluctuations and their impacts in the region are often large, and good predictions of these fluctuations will often be possible. He further noted that an important part of the CLIPS project is to promote studies of specific climate impacts where predictions might be used (e.g. agricultural crops, water resources, environment, etc.), therefore there is an opportunity to develop such studies in the Pacific islands region.

OTHER ISSUES

The SPREP Secretariat introduced the paper on long term planning and regional coordination of regional and international meteorological and climate programmes. The paper, attached as Annex IV to this report, was considered and endorsed by the meeting. The Secretariat also proposed that the annual meeting of meteorological service directors be held every two years instead of the present annual arrangement in view of the costs involved and to allow adequate time to implement the range of recommendations proposed by the meeting. The Secretariat also introduced a draft fixed agenda for future RMSDs. The meeting considered both proposals and agreed to keep the present annual meeting arrangements

until 1998 and endorsed the fixed agenda. The meeting urged the Secretariat to explore the possibility of hosting the 1998 meeting jointly with either WMO, the EU Cyclone Warning System Upgrade Project, and/or other interested parties in order to share the costs of hosting such meetings. The meeting also agreed that the issue of biennial meetings be considered in 1998.

The meeting then considered the draft executive summary and recommendations prepared by the Secretariat and members of the drafting committee. The participants made changes to the

draft and formally adopted the amended executive summary and recommendations.

There being no other business, the SPREP Secretariat called upon Mr Gerald Miles, Head of SPREP's Environmental Management and Planning Division (EMP) to officially close the meeting. Mr Miles thanked all the countries for the fruitful meeting and wished everyone a safe return. Australia, on behalf of the participants, thanked the SPREP Secretariat for organising the meeting. The meeting was officially closed on 10 July 1997.

ANNEX I: PARTICIPANTS

AMERICAN SAMOA

Mr Akapo Akapo
Meteorologist
National Weather Service
TAFUNA
American Samoa

Telephone: (684) 699 91303

Fax: (684) 699 1550

AUSTRALIA

Mr Rex Falls
Regional Director
Bureau of Meteorology
GPO Box 413
Brisbane
QUEENSLAND 4001
Australia

Telephone: (617) 864 8739

Fax: (617) 221 4895

email: R.Falls@bom.gov.au

COOK ISLANDS

Mr Arona Ngari
Director
Cook Islands Meteorological Services
P O Box 127
RAROTONGA
Cook Islands

Telephone: (682) 20603/25920

Fax: (682) 21603

email: angari@met.co.ck

FEDERATED STATES OF MICRONESIA

Mr Akira Suzuki
Coordinator/Officer in Charge
FSM Weather Service Office
P O Box 69
POHNPEI STATE
Federated States of Micronesia 96941

Telephone: (691) 320 2248

Fax: (691) 320 5787

email: weather@fm

FIJI

Mr Rajendra Prasad
Director
Fiji Meteorological Service
Private Mail Bag
NADI
Fiji

Telephone: (679) 724 888

Fax: (679) 720 430

FRENCH POLYNESIA

Mme Isabelle Leleu
Assistant Director
Meteo France-
Direction Re'gionale eu Polynesie Francaise
BP 6005-FAAA Aeroport
98702 TAHITI
French Polynesia

Telephone: (689) 80 33 02
Fax: (689) 81 96 91 *or*
(689) 80 33 09

KIRIBATI

Mr Tekena Teibita
Officer in Charge
Meteorological Division
Government of Kiribati
PO Box 486
TARAWA
Republic of Kiribati

Telephone: (686) 26511
Fax: (686) 26089

MARSHALL ISLANDS

Mr Paul Peter
Director
RMI Weather Service
P O Box 78
MAJURO
Republic of Marshall Islands 96960

Telephone: (692) 625 3214
Fax: (692) 625 3078

NAURU

Mr Joseph Cain
Senior Project Officer
Department of Island Development and Industry
Government Offices
YAREN DISTRICT
Republic Nauru

Telephone: (674) 444 3181
Fax: (674)4443791

NEW CALEDONIA

Mr Claude Gaillard
Regional Director
Meteo France
BP 151
NOUMEA
New Caledonia

Telephone: (687) 27 30 00
Fax: (687) 27 42 95
email: claude.Gaillard@meteo.fr

NEW ZEALAND

Mr Garry Clarke
International Operations
Meteorological Services of New Zealand Ltd
P O Box 722
WELLINGTON
New Zealand

Telephone: (644) 472 9379
Fax: (644) 473 5231
DDI: (644) 470 0774
email: clarke@met.co.nz

NIUE

Mr Sionetasi Pulehetoa
Manager
Niue Meteorological Service
P O Box 37
ALOFI
Niue

Telephone: (683) 4001
Fax: (683) 4010

REPUBLIC OF PALAU

Mr Hirao Kloulchad
Office in Charge
Weather Service Office
P O Box 520
KOROR
Palau 96940

Telephone: (680) 488 1034
Fax: (680) 488 1436

PAPUA NEW GUINEA

Mr James Nako
Director
PNG National Weather Service
Department of Civil Aviation
P O Box 1240
BOROKO
Papua New Guinea

Telephone: (675) 325 2788
Fax: (675) 325 2740

SAMOA

Mr Faatoia Malele
Deputy Superintendent
Apia Observatory
Mulinnu
APIA
Samoa

Telephone: (685) 20855
Fax: (685) 20857

Solomon Islands

Mr Mike Ariki
Director
Solomon Islands Meteorological Service
P O Box 21
HONIARA
Solomon Islands

Telephone: (677) 21757/758
Fax: (677) 20046

TONGA

Mr Paea Havea
Chief Meteorological Officer
Ministry of Civil Aviation
P O Box 845
NUKUALOFA
Tonga

Telephone: (676) 23 401
Fax: (676) 24 145

UNITED STATES OF AMERICA

Mr Edward Young
Technical Services Division
US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service Pacific Region
737 Bishop Street Suite 2200
HONOLULU
Hawaii 96813

Telephone: (808) 532 6412
Fax: (808) 532 5569
email: Edward.Young@noaa.gov

VANUATU

Mr Henry K Taiki
Director
Vanuatu National Meteorological Service
Permanent Representative of Vanuatu with WMO
Private Mail Bag 54
PORT VILA
Republic of Vanuatu

Telephone: (678) 22 331
Fax: (678) 22 310

WALLIS AND FUTUNA

Mr Jacques Techer
Hihifo Airport
BP 02
98600 UVEA
Wallis and Futuna

Telephone: (681) 722 446
Fax: (681) 722 925

PACIFIC ENSO APPLICATION CENTER

Mr Alan C Hilton
Pacific ENSO Application Center
c/- U.H. Department of Meteorology
2525 Correa Road, HIG Room #331
HONOLULU
Hawaii 96822

Telephone: (808) 956 2324
Fax: (808) 956 2877
email: hilton@soest.hawaii.edu

NOAA

Mr Anthony Barnston
Climate Prediction Center
NOAA National Center for
Environmental Prediction (NCEP)
NOAA NWS W/NP51
5200 Auth Road, WWB Room 806
Camp Springs
MD 20746-4304

Telephone: (301) 768 8155 ext.7515
Fax: (301) 763 8395

UNIVERSITY OF GUAM (UOG)

Mr Charles Guard
Research Associate
Water and Energy Research
Institute of the Western Pacific
University of Guam
UOG Station
MANGILAO
Guam USA 96923

Telephone: (1671) 735 2695
Fax: (1671) 734 8890
email: chipguar@uog.edu

UNITED STATES DEPARTMENT OF ENERGY (USDOE)

Dr William Clements
Program Manager
Tropical Western Pacific Program Office
US DOE ARM Program
Los Alamos National Laboratory
EES-8; Mail Stop D407
Los Alamos
NEW MEXICO
USA 87545

Telephone: (505) 667 1186
Fax: (505) 667 912
email: twpoff@lanl.gov

VAISALA PROPERTY LIMITED (VPL)

Mr Simon Harrod
Vaisala Pty Limited
80 Dodds Street
South Melbourne
VICTORIA 3205
Australia

Telephone: (613) 696 5699
Fax: (613) 696 5776

WORLD METEOROLOGICAL ORGANIZATION (WMO)

Mr Eisa Al-Majed
Director
Regional Office for Asia and the South West Pacific
41 Ave, Giuseppe-Motta
Case Postale No. 2300
CH-1211 GENEVA 2
Switzerland

Telephone: (4122) 730 8510
Fax: (4122) 734 2326
email: al-majed_e@gateway.wmo.ch

RESOURCE PEOPLE

Dr Reid Basher
Manager Climate Analysis and Application
National Institute Water and
Atmosphere Research Ltd (NIWA)
P O Box 3047
WELLINGTON
New Zealand

Telephone: (644) 472 9966
Fax: (644) 496 9411

Mr Collin Schulz
Satellite Project Engineer
35 Kocho Road
Nambour
QUEENSLAND 4560
Australia

Telephone: (617) 544 11 381
Fax: (617) 544 11 381
email: colin.schulz@giga.not.au

Dr Don Thompson
Chairman, WMO RA-V
Working Group on Climate Group
Meteorological Service of New Zealand Ltd
P O Box 722
WELLINGTON
New Zealand

Telephone: (644) 389 4809
Fax: (644) 389 4809

LANGUAGE SERVICES

Language Services coordinated by:
Language Professionals Ltd
P O Box 3461
AUCKLAND
New Zealand

Telephone: (649) 376 1216
Fax: (649) 360 1641

Dr Emy Watt
Mr Patrick Delhay

SPREP SECRETARIAT

P O Box 240
APIA
Samoa

Telephone: (685) 21929
Fax: (685) 20231
Email: sprep@sprep.org.ws
Webpage: <http://www.sprep.org/ws>

Mr Tamari'i Tutangata
Director

Mr Gerald Miles
Head, Environmental Management and Planning Division

Mr Penehuro Lefale
Meteorology/Climatologist Officer

Ms Saunoa Mata'u
Conference Assistant

Mrs Tumema Fuimaono
Divisional Assistant

ANNEX II: ADDRESS BY DIRECTOR OF SPREP

Hon. Molio'o Teofilo, Minister of Agriculture,
Forests, Fisheries and Meteorological Service of
Samoa

Rev. Fofoa Semese

Mr Eisa Al-Majed, Regional Director, Regional
Office for Asia and South West Pacific

Distinguished delegates and representatives of the
Government of Samoa

Invited guests

Ladies and gentlemen

It is with great pleasure that I join the Hon. Minister to welcoming you all to this Fourth SPREP Meeting of Regional Meteorological Service Directors. This is the second time you are meeting in Apia and it is heartening to see so many of you here again to further progress made at your last meeting and in the intervening period. For the first time participants, I welcome you to Apia, enjoy the challenge of the meeting.

Charles Dudley Warner, a noted 19th century American writer and journalist, possessed a quiet humor and mellow grace that endeared him to his countrymen. In 1897, in a editorial in the Hartford, Connecticut Courant, he made the now classic observation that "*Everybody talks about the weather, but nobody does anything about it.*" The following year, 1898, a Swedish Scientist, Svante Ahrrenius interested in Warner's observation warned that carbon dioxide emissions could lead to global warming and accelerated climatic changes. Sadly, neither Warner's observation nor Ahrrenius' warning was taken seriously. But thanks to the increasing understanding of the earth-atmospheric system by scientists this observation and warning were finally brought to wider global attention and acceptance in the 1970s.

Warner's now famous observation needs to be re-phrased today to read "*Everybody should talk about the weather and do something about it*" and Ahrrenius' warning should be "*taken very seriously*". I believe this is why we are all here, to talk about the weather, heed the warning by Ahrrenius and do something about it.

Today, faced by the frightening spectre of ever-increasing weather and abnormal climatic events occurring worldwide more often, the international community is also now beginning to address the global warming and climate change threat seriously. Our region is now engaged in undertaking national and regional activities to assist these international efforts. This meeting is a part of those efforts.

Let me also share with you my recent experience with one UN agency's efforts to address weather and climate change matters. A few weeks ago, I attended the 49th Session of the World Meteorological Organization's (WMO) Executive Council in Geneva in which I witnessed the determination of WMO under its various programmes to do something about the weather and climate. It was a pleasure to be alongside a group of eminent and dedicated scientists from all over the world who are willing to take on Ahrrenius' challenge.

For my part, I was happy to inform the WMO Executive Council of our own region's efforts to contribute to these global programmes. It was pleasing to note the agenda for that Council meeting included a focus on the WMO-SPREP working relationship.

Turning now to SPREP's work programme, the broad goal of SPREP is to coordinate and facilitate sustainable development in the region. We all accept that our region is vulnerable to climatic and weather variability, and any effort to meet sustainable development in the region must take these into account. I also know that the work you all undertake, whether it be research, weather forecasting, data collection, computer modeling and so on, contributes towards the efforts of your respective countries in striving for that goal of sustainable development. It is for this reason that we in the SPREP Secretariat, accord meteorological, climate matters and climate change as one of our high priority programme activities.

Distinguished delegates, your main task here is to review the meteorological and climate change components of our climate change programme particularly in relation to strengthening regional coordination in meteorological and climate activities. From our view point, we would like to know how we can further improve our on-going efforts to strengthen regional coordination in these areas. In this context, I would like to refer to some of the issues which I feel may need closer attention at this meeting.

At the Second Meeting of this group, we laid down a challenge about the future of meetings such as this one. In that meeting, we stated that “the future of meetings such as this one is contingent upon adequate funding being available from interested donors” and posed to you for your consideration the following questions:

1. Are such meetings necessary for regional cooperation?
2. Are governments willing to provide money towards a regional meteorological cooperative?
3. What areas require coordination, and what areas do not?
4. What degree of formality do we need to provide the level of coordination desired?

I believe that these same issues are still relevant today. You may have already noted in this meeting’s agenda that we are not proposing any new activity but merely reviewing progress made since the last meeting of on-going national, regional and international activities which are geared towards strengthening regional cooperation in climate monitoring and climate data service.

This meeting is also a timely opportunity for you to provide direction and guidance to us on the activities that we, as your Secretariat, should be undertaking in the coming years. We would be particularly grateful if you could look closely at proposals you identified in previous meetings such as the Climate Data Resource for Environment and Sustainable Development (CDRES D) and Pacific Islands Regional Climate Bulletin to name a few, which we have now completed and for you to inform us on how we can move them forward. In referring to this, I am pleased to note the increase in the number of Pacific islanders sitting around the table today. We in the Secretariat are working towards re-defining our roles in implementing and coordinating programmes in the region. My hope is that within the next 10 to 15 years, you will fully have the capability on the national level to implement projects while we concentrate on coordination.

To conclude, I would like on behalf of all the delegates, and the Secretariat, to thank the main sponsors of this meeting, the Republic of China (Taiwan), the US Department of Energy’s Atmospheric Radiation Measurement (ARM) Program, Vaisala Pty Limited, Meteorological Services of New Zealand Ltd, and the Samoan government for the generous financial and other support which allow us to organise this meeting.

Ladies and gentlemen, you have a full agenda in which you have only three days to complete. I wish you well in your discussions and may you all have a pleasant and enjoyable stay here in Apia. Soifua.

ANNEX III: COUNTRY REPORTS

AMERICAN SAMOA

Mr Akapo Akapo, Director of NWS, thanked the Secretariat for organising the meeting. He then updated the meeting on his office's on-going activities. These include:

- Added capability within the office to receive models and high resolution metsat data, thanks to the US NWS in Honolulu for assistance
- Upgrade their AFTN circuit from 75 baud to 9600 baud. He said there were several problems with the new circuit so they continued to use the 75 baud circuit
- Staffing: two newly recruited meteorologists
- Coordinate closely with the Samoa Meteorological Service.

AUSTRALIA

Mr Rex Fall, from the Australian Bureau of Meteorology, informed the meeting that the Australian Director of Meteorology, Dr John Zillman, regrettably was unable to attend the meeting due to other commitments. He said Dr John Zillman sent his apology and conveyed his wishes for a successful meeting. He said training programmes on Tropical Cyclones, CLICOM continued to be the focus of the Bureau's assistance to Pacific Island Countries' NWS. He stated that the Bureau's office in Darwin puts out weekly analysis of 30-60 days oscillation. The Bureau is also looking at the possibility of installing more automatic weather stations for observations. He said the Bureau is looking for low-communication systems to support regular communications and observations for the Pacific Islands.

COOK ISLANDS

Since the third session of the SPREP Meeting of Regional Meteorological Service Directors, few activities has taken place that have drastically changed the perception of the Cook Islands Meteorological Service. Some of the changes have been excellent and have been readily accepted,

while some have not been accepted, although the changes took place, regardless. A few weeks after the above session, WMO advised the Cook Islands that it has officially become a member of WMO.

Reform: The government of the Cook islands has recently undergone a reform of its public service. The outcome of this reform resulted in the reduction of staff members of the CIMS from 24 to 13. Most of the staff affected were from the outer islands.

Automatic weather station: Due to the reform, the consultancy by the Meteorological Service of New Zealand Ltd, saw the installation of 6 automatic weather station as an NZODA project. Of the 6 stations installed, only one is not operated due to some electronic faults. These were put in place as of 1 July, 1996.

CLICOM: This project is at a stand-still due to the resignation of the staff concerned. Data from NIWA has been added to the system prior to the offices resignation. Due to the unfamiliarity with the CLICOM package, a small database was set up to store the current reports from the AWS, when they can be exported into CLICOM at a later date.

Training: The station technical officer has undergone some hands on training for this installation of the AWS with the aide of technical support from Meteorological Service of NZ Ltd.

One staff member has just completed the Assistant Forecaster's Course that was held in Melbourne, Australia for 6 months, which qualified him to be a WMO Class II Forecaster. Another staff member has currently just completed the Pacific islands Level III Course with the Meteorological Services of NZ Ltd.

Cyclone: During the 1995/96 cyclone season, two cyclones indirectly affected the Southern Cook Islands. Cyclone Evans passed 400 miles to the west of Rarotonga and only brought high seas

while cyclone Hina brought some periodic strong winds.

Satellite Receiver: Although at times it misses a picture, this tool has been utilised to animate frames for media use and as well as an education reality for some students in Secondary Schools. Difficulties are at times found in the capturing of some images and the incorrect allocation of files into different root directories.

FEDERATED STATES OF MICRONESIA

Since the Third Meeting of Regional Meteorological Service Directors, the three (3) FSM Weather Service Offices, located at Yap, Chuuk and Pohnpei States, along with the Republic of Belau and Republic of the Marshall Islands Weather Service Offices have adopted METAR programmes into the micro-computer-aided paperless surface observations (MAPSO) and are maintaining the same level of operations. The upper-air (MicroART) programmes of 000z, 1200z and special soundings during cyclone passage with the Vaisala radiosondes observations are performed on a daily basis and will continue until the year 2001 when the Compact of Free Association with the United States of America is terminated.

The coastal marine network (CMAN) stations installations to Micronesian remote atolls have been expanded to provide JTWC, NWSO Guam and weather service offices to monitor the cyclone development and tracks.

The FSM Weather Service Office in Pohnpei and Chuuk have been subscribed to internet system and e-mail capability. The Federal Aviation Administration (FAA) is up-grading the extel comwriter communication network at all weather service offices and SAWR which will be fully operational by August 1997. The PEACESAT installation plan with WSO Pohnpei to be a pilot site with the emergency management and health service offices is in progress and scheduled for the installation and will be in operational within a few months.

The FSM government is very pleased and thankful for the Bureau of Meteorology, Australia, for the funding of satellite receiving equipment and

SPREP assistance in coordination of installation and training of satellite receiving system at WSO Pohnpei in the near future.

The FSM Weather Service is seeking assistance to USA and SPREP to investigate a CLICOM computer software programme for climate which will be compatible with the pentium computers being used in all micronesia weather service offices.

The FSM WSO extends its appreciation to ENSO Application Centre for the ENSO newsletter being regularly received and passed on to government and private decision making individuals, We strongly requested the ENSO Application Centre to continue providing ENSO Newsletter which is essential to users.

The US National Weather Service and FSM Government joint funding of one meteorologist trainee at the University of Hawaii for each weather service office is in progress. We hope the first one to be graduated by the end of this year with BSc degree in meteorology.

The FSM Government will be making a formal request to WMO and SPREP for the funding of one each climatologist and agrometeorologist fellowship type training which are urgently needed for our government.

FSM government has appointed a focal point person for hydrological matters and his name has been transmitted to WMO as contact person for our government.

The FSM Climate Change Co-ordinator position has been established at the FSM National Government since 19895 which deals with the IPCC and other climate matters. This office has a close working relationship with the weather service offices.

Due to decrease of Compact of Free Association funding from the USA to FSM government which will end in 2001, the FSM National government and each State of Governments are in a process of down sizing the government structures to cope with the limited funding to meet the essential services.

On behalf of the FSM government, I would like to extend our appreciation to SPREP for the kind invitation to this meeting in Apia and the previous meetings in which I have participated and learned a great deal of regional and international matters on meteorological and hydrological issues. Thank you.

Fiji

Mr Rajenda Prasad, Director, presented a paper on Fiji Meteorological Service's role and responsibilities both within Fiji and the region during the first day of the meeting. On regional co-operation, he said Fiji would be keen to assist other countries in the region on CLICOM.

FRENCH POLYNESIA

Ms Isabel Leleu, Assistant Director, said that the paper presented at the Second SPREP Meeting of RMSD held in Nadi, Fiji in 1994, is still valid for the roles and functions of Meteo France in its territories. She said due to latest budgetary problems, upper air observations and staff have been reduced. Upper air observations are now being reduced from 8 to 5 and they are looking at using GPS in the future. They had also installed a 4800 baud connection to the GTS.

REPUBLIC OF KIRIBATI

Mr Teitiba said the Ministry of Environment and Social Development seems to be the focal point for all climate change activities for Kiribati. This arrangement needs to be changed as the Meteorological Service is responsible for climate and climate change matters. On equipment; he said Kiribati will be getting HF links to the outer islands. He expressed concern at the unreliable communication links to Nadi. His office continued to communicate via fax. Mr. Teitiba also told the meeting the AFTN link is not accessible to the meteorological service. On observations, he said they are looking at acquiring AWS, one station for all the outer islands. On training, he saw the need for more Kiribati Meteorological staff to obtain further training in Australia and Fiji. Kiribati is still not a member of WMO and his government is looking at the matter.

REPUBLIC OF THE MARSHALL ISLANDS

Thank you Mr Chairman, fellow directors, ladies and gentlemen. I would like to bring greetings from the Marshall Islands to all the delegates assembled here today. Our last meeting took place in November 1995 as you all know. It is a pleasure for me to meet with you all here in Apia, Samoa once again.

A recap of progress made in my country during the past one and a half years includes:

- Upgrade of the MASO Computers for improvement of speed and accuracy
- Update MicroARTS new Version 2.90 for improvement of the programme
- Installation of ten rainfall stations in the Republic

Certification of one Weather Service Specialist added to the staff.

Weather in general throughout the Republic of the Marshall Islands and its area of responsibility includes mostly weather of general nature – as we had no typhoon during this period. There are very few storms developed Northwest of our area and moving westward. At the present time, our Weather Communication system has been updated by a more modern system which will be more effective. This will be operative within three weeks. The Australian donated SEAFRAME through SPREP's Sea Level Rise and Climate Monitoring project, is in operation and on-station computer training for the time display is still welcome. On the local scene, as you all know—we have a new President. Our late President died last December and his cousin, Senator Imata Kabua took office. For your information, RMI has made progress under the Administration of the Former President Amata Kabua. Under his Administration, RMI bought Airplanes and conceived the present Air Marshall Islands Airline, which has greatly facilitated travel to and from outer islands. This has proven to be life saving in many cases, especially where patients in serious conditions were airlifted to the district Centre for emergency medical attention. Of course, the RMI has made progress in other areas also due to the progressive thinking of our late President. One notable example is our New Outrigger Hotel,

which is very attractive and is a model 150 room Hotel.

NEW CALEDONIA

Mr Gaillard thanked the Secretariat for organising the meeting. He said New Caledonia had the same system as French Polynesia. He said the report submitted to the 1995 meeting remains valid.

Communications: They have a 9600 baud circuit link to Melbourne. They also had links to Tahiti (2.8 kbit) and Toulouse (9.6 kbit). The New Caledonia Meteo France office has 89 staff, with 5 forecasters. They do not have a 24 hours operation except during the cyclone season.

Future plans: The office is planning to acquire a new Vaisala GPS for upper air observations, a weather radar to be installed north of the main island and other isolated places. They will also upgrade SAT and send the current system to Wallis and Futuna.

NEW ZEALAND

Mr Clarke thanked the Secretariat for the invitation. He then proceeded to his presentation. Since corporatisation, new NZ Meteorological Service (NZ Met Service Ltd) had 57 per cent of its income from the New Zealand government. The new NZ Meteorological Service has two arms, the Business arm, Metra and the Government Services arm, the Met Service. Since implementing the new structure, they have reduced costs to government, services have improved, accuracy has improved. He said the communication costs which are free to the meteorological community costs NZ\$150,000 per year. NZ Met Service Ltd no longer employed observers around the country but the stations are either being automated or contracted out. He said this new arrangement had reduced the costs but also made the observations much more accurate. They had four weather radar in the country. On operational costs, they had an alliance with the NZODA (Foreign Affairs) which has USAID-type programmes which provides them with contracts. They also managed the WMO World Weather Watch projects in New Zealand and provide technical assistance. They have undergone major restructuring resulting in a 66 per cent manpower cut in order to achieve

profits. Mr. Clarke also mentioned their contract to the New Zealand/Fiji governments to review the Fiji Meteorological Service. The review report is now with the government of Fiji.

Dr Don Thompson, Director of NIWA and climate expert to the NZ Met Service briefed the meeting on NIWA's current activities. He said NIWA's research programmes focussed on the following areas; climate, fishing, and hydro meteorology. He said about 40 staff worked in the climate research programme. On funding, he said one third of funding comes from companies and private entities and two third comes from the research foundation set up by the government. He said it would be difficult to help small islands unless assistance comes from SPREP. They had shifted from applied research to more basic research. He also mentioned the importance of getting the proposed CEDRES project implemented. Met Service Ltd has direct access to the NIWA data base. They had installed about five automatic weather stations per year.

NIUE

Mr Pulehetoa thanked the Secretariat for organising the meeting. He said the Niue Meteorological Service is a small service with very small staff. They have one circuit to Christchurch shared with Telecom. The Niue government is planning to commercialise both Telecom and the Met Service. Niue has recently become a member of WMO.

REPUBLIC OF PALAU

Mr Kloulchad thanked SPREP for inviting his country to the meeting. He briefly described where his country was and its social, economic and development infrastructure and make up. He said Palau is a popular holiday destination and has an estimated 70,000 visitors every year. On his office, he said one girl is now being trained at the University of Hawaii as a Meteorologist.

PAPUA NEW GUINEA

Mr Nalo thanked the Secretariat for the invitation to the meeting. He said that due to office restructuring, training of new staffs was held back. He said the PNG NWS had an annual budget of

Kina 2 million. Policies played a big role in placing weather stations throughout PNG. On communications, they are now trying to establish a GTS link to Melbourne to replace the AFTN. The US department of Energy Atmospheric Radiation Measurement project had funded a V-Sat system. Australia continued to fund preparation of METSAT. PNG NWS is now considering commercialisation (privatisation) of its weather service.

SAMOA

Mr Liae said the Samoa Meteorological Service only had one synoptic station for four inhabited islands which is not enough. Through assistance from NOAA NWS, six automatic weather stations were installed, three in Upolu and three in Savaii. On staffing, he said the Samoa Meteorological Service desperately needed qualified staff particularly forecasters and meteorologists. As such, the need for forecasting training is of the highest priority for them. On communication, Mr Liae said that a better link to Fiji or elsewhere is also another priority. They are only using facsimile to relay and receive data from Nadi. He urged donor countries to assist his office.

SOLOMON ISLANDS

Mr Ariki thanked the Secretariat for organising the meeting. He said not much has changed in the Solomon Islands Met Service (SINWS) since the last progress report presented to the same meeting in 1995. He said SINWS continued to operate seven synoptic stations, one for upper air observations. He said they cannot afford the GPS. SINWS has two HF radio for communications. The weather office operation hours were from 5am-5pm and 24 hours during cyclone season.

TONGA

A defined meteorological programme has been operational in Tonga since late 1944. New Zealand expatriates provided support through to 1970 when management was transferred to Tonga. However, the New Zealand Meteorological Service (NZMS) withdrew its financial assistance in June 1990, so the Tongan government owned

and financed its own Meteorological Service since then, especially staff salaries.

The Tonga Meteorological Service (TMS) today provides a fundamental service to the Kingdom, comprising weather observations throughout the Tonga Group, the provision of general land, marine and aviation weather forecasts, receipt and monitoring of cyclone warnings, and the provision of general data and climatological information.

TMS is funded almost wholly by the Tongan government. Funding is also provided through the NZMS for instrument supply and maintenance and spare parts. Management service, technical and planning support also continues to be provided by the NZMS as required.

Since 1984, the TMS has been attached to the Ministry of Civil Aviation. In January 1996, the Service became a full member of WMO.

The TMS's Headquarters is located adjacent to the Civil Aviation Headquarters, corner of Salote Road and Tupoulahi Road, Nukualofa. The office is manned by the Chief Meteorological Officer, Paea Havea, one junior met staff and the computer operator.

Observing Stations: There are 7 observing weather stations throughout the Tonga Group; Niufo'ou, Keppel or Niuatoputapu, Luapepau'u Airport in Vava'u, Ha'apai, Ha'afeva and Nomuka in the Ha'apai group, and Fuamotu Airport in Tongatapu.

Climate Stations: Vava'u, 'Eua, Vaini and Nuku'alofa.

A staff of 14 employed by TMS, five in Lupepau'u, six in Fuaámoutu and three in Nuku'alofa.

Weather Observing Programme

Synoptic: Surface weather observations are made three (3) or six (6) hourly. Used by regional and global weather services to analyse present weather stations.

Climate: Climatological surface observations are made once per day, measuring daily (24 hours) temperatures, maximum and minimum, and

rainfall, utilised to establish long term trends in weather and climate change scenarios.

Upper Air: Weather balloons are flown at the Fuamotu station only twice a day at 10000 and 23000 UTC respectively.

Rainfall: Some stations comprise only a simple rain gauge, read once a day.

METAR: Meteorological aviation reports prepared daily.

Dissemination of weather reports

All synoptic reports are sent to Nadi, Wellington, Melbourne and other forecasting centres around the world via the Civil Aviation AFTN (Aeronautical Fixed Telecommunication Network). Other outer island reports are first passed to Tonga via Tonga Telecom links to Fua'amotu where they are entered into the AFTN for onward transmission to Nadi.

International METAR reports are also utilised immediately, predominantly by Nadi Regional Forecasting Centre, but also by incoming and outgoing aircraft from Fuamotu and Lupepauu (Vavau). Other METAR type reports are prepared by Civil Aviation staff at all island aerodromes.

Climatological observations are collated monthly and presently sent to the New Zealand National Institute for Water and Atmospheric Research (NIWA) for archiving. This data is also archived by the TMS in order to commence its database using CLICOM. The CLICOM system was provided by WMO, SPREP and NIWA. It is a pity that the TMS has no qualified climatologist yet.

Services to the Government of Tonga

Direct services to the Government of Tonga generally focus on the provision of Special Weather Bulletins regarding Tropical Cyclone situations, strong wind warnings, public weather forecasts and marine weather bulletins. All special weather bulletins are forwarded to Tonga immediately after receipt and following translation into Tongan at Nukualofa Met Office. Other services such as climatological data (long term statistical information) is provided as required. At present the Nukualofa office is entering most of

its data immediately into a database, as mentioned above. Services to the public comprise mainly the provision of weather maps and forecasts at the Nukualofa office. Cyclone warnings are passed to Radio Tonga for immediate broadcast in both Tongan and English. They are also sent to the Nukualofa Coast Watch station for broadcast to ships at sea. Copies of cyclone warnings are delivered or faxed to the Hon. Prime Minister, Minister of Natural Disaster Management Committee, Foreign Ambassadors or High Commissioners, Commander of the Tonga Defence Services, Police Commander and many others.

Status of observing stations

Fua'amotu: Observing equipment is basic but sufficient to enable the climatological and synoptic programme to continue. Some equipment is provided and maintained by the NZMS under its on-going technical co-operation assistance programme. Anemometer was installed by NZMS in 1979 and is still in operation. All other observing equipment such as thermometers, thermograph, and so forth were supplied by the NZMS as a contribution to the TMS programme. Exchange of equipment, if necessary continues between NZMS and TMS paid for by NZMS. The briefing office at the Fuaamotu new terminal has only a radio facsimile receiver. Wind speed and direction equipment are located at the main observatory across the runway. AFTN communications equipment is located at the main observatory.

Nuku'alofa: Equipment includes anemometer, a Stevenson screen and a 5" manual raingauge for daily climate observation. A computer system for operation of the CLICOM system has been donated by Australia and is utilised for this purpose. A satellite weather receiving system was donated jointly by SPREP and WMO. The system is functioning properly. A real-time display system has been provided by the National Tidal Facility. However, this system has not been able to operate since November 1996 due to technical problems. Weather maps are received by radio facsimile, and an analysis drawn by hand for public use, display together with public weather forecast or strong wind warnings.

Other island groups: Thermometers, Stevenson screens and raingauges required at all

climatological and synoptic stations throughout the Kingdom, are provided by the TMS. All except Niuatoputapu Lupepauu Airport, do not have anemometers.

Communications

Tonga Telecommunication Commission provides communications throughout the Kingdom, from their base at Nukualofa. In respect of the TMS, use is made of telephone and AFTN services which although operated by Civil Aviation run via Telecom landlines. Cable and Wireless operates the international telecommunication links via satellite. The main control centre and satellite antenna is located in Nukualofa, adjacent to Tonga Telecom, and reasonably close to the Nukualofa Met Headquarters.

Communications and Tropical Cyclone

Procedures: An issue of concern however, is with regard to the distribution of weather observations during cyclone or strong wind events. Cable and Wireless must secure their satellite antenna into a vertical position when winds approach 60 knots. This is in order to protect it from storm damage. This results in close down of communications. This has actually happened when Tropical Cyclone Hina moved across Nukua'alofa in March 1997. Tonga lost communication with the outside world for about 5 hours.

Training: TMS provides trainees with at least three months basic training followed by supervised shift duelling. There would be strong benefits in providing specific classroom type instruction at this level. In the past few months, the Fiji Meteorological Service provided Level I Met Training Course for two months, whereas the NZMS provided Level II and III in Nukua'alofa and Wellington respectively.

Inspection and Maintenance: The on-going inspection and maintenance programme has been maintained in order to ensure the accuracy of readings. Yearly or at least two yearly inspections of all outer island stations should take place.

Presently the Chief Met Officer undertakes most inspections. Old screens or faulty thermometers were replaced by the NZMS free of charge.

Generator: A new generator has been installed close to the met office in Nukuaalofa for back up.

UNITED STATES OF AMERICA

Mr Young thanked the Secretariat for organising the meeting and relayed his Director's apologies for not being able to be in the meeting. He said the US National Weather Service, Pacific (USNWS) region, Honolulu, had a number of planned activities over the next year for US affiliated members. He said NWS had recently upgraded Met Circuits from AF to AFTN. On staffing, they are planning to expand American Samoa, and Yap, FSM forecast offices. Mr Young also briefed the meeting on the newly developed Emergency Managers Weather Information Network (EMWIN) and stated that this system is of great value for Pacific island countries' Met Offices and Disaster Manager's Offices.

VANUATU

Mr Taiki thanked the Secretariat for organising the meeting. Like the Solomon Islands, Vanuatu also had not had much changes since his last report to the 1995 meeting. Training continued to be a key issue for the Vanuatu Meteorological Service (VMS). They have upgraded Upper Air observations to a GPS. The VMS is undergoing major restructuring but is not corporatising.

WALLIS AND FUTUNA

Mr Techer thanked the Secretariat for the invitation to the meeting. The Wallis and Futuna Meteorological Service (WFMS) has 15 staff, two expatriates and 13 locals all of them trained in France. There are three people on Futuna. The WFMS has four forecasters. The office is linked to Noumea office. They recently installed a V-Sat system.

ANNEX IV: LONG TERM PLANNING AND REGIONAL COORDINATION

Timeline of Climate-related Projects in Pacific Islands Region

