



SPREP

South Pacific Regional Environment Programme

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

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Summary of discussion

1. Opening session

1.1 Opening ceremony (agenda item 1.1)

Mr Lefale of the SPREP Secretariat called the meeting into session. Mr Lefale invited Reverend Peteru Tone to deliver the opening prayer. Following the prayer, opening remarks were made by the Honourable Minister Mafasolia Papu Vaai, Department of Agriculture, Forest, Fisheries and Meteorology, Government of Samoa and the Director of SPREP, Mr Tamari'i Tutangata, and Mr Michael Jarraud, Deputy Secretary General of the World Meteorological Organization (WMO).

In his opening remarks, the Hon. Minister Vaai reminded the participants of their importance as 'watchers of our atmosphere, sea and land and he noted the importance of the Needs Analysis, encouraging Meteorological Service Directors and sponsoring organisations to fulfil their shared responsibilities in the region.

The Director of SPREP, Mr Tutangata set the scene for the meeting by reminding participants of the exciting evolution of the RMSD meeting process from the first meeting in 1993 to the present. Mr Tutangata took particular note of the initiation of the following milestones in the RMSD process: the initiation of a long-term planning process in 1997; the 1998 meeting in Honolulu, Hawaii where the scope of work for SPREP was broadened to cover meteorology and climate matters in addition to its climate change programmes; the adoption of the Strategic Plan in Tahiti in 1999; and the convening of the Needs Analysis Expert Team in January 2000. Mr Tutangata highlighted the importance of the Needs Analysis regional synthesis report and the 21 individual country reports as providing the foundation for the future of meteorological services in the region. Mr Tutangata took note of the two consistent themes that emerged from the Needs Analysis report:

- The majority of the National Meteorological Services (NMSs) in the region are struggling and often fail

to provide basic services for the citizens and industries of their countries; and

- The position of most countries regarding development programmes is that they must be sustainable within the approved in-country NMS budgets and that assistance may be required with ongoing costs.

Mr Tutangata highlighted the opportunity that completion of the Needs Analysis provides for Meteorological Service Directors, regional partners and sponsoring agencies to collectively address deficiencies and achieve the objectives of the Strategic Plan. Mr Tutangata confirmed SPREP's willingness to help secure the resources necessary to implement the projects identified in the Needs Analysis. In closing, Mr Tutangata urged participants to revisit the question of the frequency of future RMSD meetings in light of the current transition from planning to implementation (recalling previous discussions suggesting that RMSD meetings be held biennially instead of annually). Mr Tutangata's opening remarks are reproduced as Annex IV to this report.

In his opening remarks, the Deputy Director General of WMO, Mr Michael Jarraud expressed, on behalf of Professor Obasi, Secretary General of WMO, his thanks to SPREP and the RMSD meeting sponsors for the invitation to WMO to participate in the meeting. He acknowledged the growing level of cooperation between SPREP and WMO to improve meteorological services in the Pacific region, particularly since the first RMSD meeting in 1993. Mr Jarraud noted the importance of weather and climate as key sectors in the Pacific and, conversely, the importance of climate processes in the Pacific to the entire world. Confirming WMO's commitment to support the Strategic Plan for Meteorological Services and the Draft Framework for Climate Change, Climate Variability, and Sea Level Rise, Mr Jarraud closed his remarks by noting that he looked forward to strengthening WMO's collaboration with SPREP, SOPAC and other regional organisations. Mr Jarraud's speech is reproduced as Annex V to this report.

1.2 Election of the Chairperson (agenda item 1.2)

The Cook Islands nominated the representative of Samoa, Mr Faatoia Malele, to chair the meeting. The Federated States of Micronesia seconded the motion. Without further nominations, the meeting unanimously elected Samoa to serve as meeting chair. The meeting chair agreed to join the representatives from Cook Islands, the Solomon Islands, WMO Sub-Regional Office for the South West Region, East-West Center, and the SPREP Secretariat as members of the drafting committee.

2. Review of conclusions and recommendations from past meetings (agenda item 2.1)

Mr Lefale of the SPREP Secretariat presented his report to the meeting. The report outlined follow-up actions taken by the SPREP Secretariat since the last Directors' meeting (period July 1999 to August 2000) in implementing the recommendations of the Sixth SPREP Meeting of the RMSDs.

The Secretariat offered one correction to clarify the funding commitment of the U.S. Government to upgrade the Weather Office in American Samoa (\$500,000 US instead of the \$1.5M US shown in item 3(e) of the Sixth RMSD Meeting Report). By request from Fiji, the SPREP Secretariat also reviewed the status of all of the essential issues addressed during the Sixth Meeting of the RMSD (Annex I to the SPREP Report on the Sixth Meeting of the RMSD). Following this status report, the representatives from Fiji and WMO offered the suggestion that future status reports be presented in the context of the activities outlined in the WMO RA V Plan. The meeting thanked the Secretariat for the detailed and enlightening report. Ms Joanne Laurence (AusAID) expressed particular gratitude to Mr Lefale for his significant contributions to completion of the PMSNAP.

2.1 Pacific Islands Climate Change, Climate Variability and Sea Level Rise Conference, Cook Islands, April 2000 (agenda item 2.2)

Mr Lefale introduced this agenda item. He provided a brief presentation summarising the outcome of the Cook Islands Conference. The meeting then considered the report of the SPREP Secretariat on the outcome of the

Pacific Islands Climate Change, Climate Variability and Sea Level Rise Conference which took place in April 2000 in Rarotonga, Cook Islands.

Representatives of SPREP, WMO, NIWA and others took particular note of the special challenges and significant benefits associated with organising a meeting that brought scientists and policy-makers together to discuss climate-related issues in the region.

Mr Jarraud (WMO) noted, in particular, that the policy officials in attendance at the Conference were able to learn about the important role that meteorological services play in providing the fundamental observations and information about climate change that underpin their decisions.

French Polynesia and WMO recommended a slight revision to the text on Page 5 related to data access and exchange, encouraging the insertion of a clause confirming that the recommendation for 'free and unrestricted access to data' was offered 'in the context of Resolution 40 of the 12th WMO Congress and Resolution 25 of the 13th WMO Congress'.

Referring to the last bullet on the top of page 6 in the report, Fiji suggested that, in light of the Workshop on GCOS that preceded the RMSD meeting, the eleventh bullet on page 5 of the report should be adjusted to explicitly acknowledge that ongoing support for meteorological instrumentation and monitoring was being done in the context of GCOS.

Australia highlighted discussion in the report related to the role that the Intergovernmental Panel on Climate Change (IPCC) in linking science and policy relating to climate change and encouraged participants to consider how the Meteorological Service Directors might best position themselves to become more actively engaged in future IPCC Assessment Reports. The meeting agreed to leave the report open for further input from participants throughout the week.

2.2 The Fifty-second WMO Executive Council (52EC) Meeting, Geneva, May 2000 (agenda item 2.3)

Mr Taiki, Programme Officer, WMO Sub-regional Office for the South West Pacific, introduced WMO's report summarising the outcomes of the 52EC. The full report is reproduced as Annex IX to this report. The meeting considered and took note of the report of the Fifty-Second WMO Executive Council (EC) meeting provided by the WMO representative.

The meeting took particular note of a number of issues addressed by the EC, including:

- measures to strengthen and enhance the visibility and status of WMO and national meteorological and hydrological services;
- the need for further careful analysis of issues bearing on the appropriate mission and role of NMSs in light of both emerging global trends and individual circumstances;
- the widening gap between the level of relevant services provided in developed countries and those of developing countries and encouraging relevant regional and international fora to address this issue;
- the need for an in-depth study so that the current emphasis on remotely-sensed data does not lead to reduction in the availability and access to observational data and products;
- reinforcement of climate-related activities at national and international levels, including a presentation by the Chairman of the Intergovernmental Panel on Climate Change;
- the future development of National Hydrological Services and their links to National Meteorological Services;
- endorsing a lead role for WMO in the Inter-agency Task Force for implementation of the International Strategy for Disaster Reduction (ISDR), noting WMO's lead agency role in the ad hoc group on 'El Niño and La Niña and climate change and variability';
- the work of WMO Sub-regional Offices;

- education and training;
- the planning process for future WMO long-term plans and ensuring that members benefit fully from and participate in WMO programmes and activities; and
- the election of future Executive Council members.

This latter point elicited some discussion among meeting participants who reinforced their interest in seeing better representation of the Pacific region on the Executive Council. In response to a question from French Polynesia, WMO elaborated on the meaning of language related to establishing emergency assistance response teams to assist NMSs whose capabilities are damaged by natural disasters. In response to a question from Fiji, Australia (Dr John Zillman) and WMO explained that while priority will be given to training requests at the Regional Meteorological Training Centre facilities, the WMO/EC language does permit training at other institutions in the region. Dr John Low (Forum Secretariat) highlighted the upcoming review of UNCED and encouraged meeting participants to work in their countries to support the development and submission of country reports to the Convention on Sustainable Development (CSD).

2.3 GCOS, SPREP Pacific Islands Implementation Workshop on Global Climate Observing System (GCOS) (agenda item 2.4)

Dr Alan Thomas, Director of the GCOS Secretariat, introduced this agenda item. He provided a brief summary of the workshop and thanked the participants for their work. He then tabled the draft Resolution of the GCOS workshop. The meeting enthusiastically received the Draft Resolution from the GCOS Workshop that preceded the RMSD meeting. After a thorough review, the meeting unanimously endorsed the GCOS Resolution (see Annex III).

3. Strategic Action Plan for the Development of Meteorology in the Pacific (SDMP), 2000–2009 (agenda item 3.1)

SPREP briefed the meeting on steps taken by the Secretariat in implementing the plan. These include adoption of the draft SDMP during the Sixth SPREP

Meeting of RSMD in Tahiti, July 1999 and the securing of financial resources from the Australian Government through AusAID to undertake the PMSNAP. The meeting took note of the final report by the SPREP Secretariat and endorsed the SDMP. A number of Directors identified the need to revise or add additional information in Appendix 1 of the SDMP to reflect the present status of their services. In particular, Kiribati, Niue, Tonga and Vanuatu want specific changes to the Appendix. The SPREP Secretariat encouraged all countries to provide accurate information as soon as possible so that the report can be revised prior to a second printing.

3.1 The Pacific Meteorological Needs Analysis Project (PMSNAP) (agenda items 3.2, 3.3, 3.4, 3.5)

Mr Lefale introduced these agenda items. In his presentation, he thanked the Australian Government for the financial assistance to the PMSNAP, members of the PMSNAP team, in particular, Mr Krishna for leading the project, other key sponsors, USA, France and New Zealand and Directors of NMSs. Mr Lefale invited Mr Krishna, Team Leader, to present the findings of the project.

Mr Ram Krishna presented a PowerPoint presentation on the project, from its inception to its completion with the key findings emerging from the study. Mr Ram Krishna requested the meeting to review the draft regional synthesis report entitled 'The Pacific Meteorological Services: Meeting the Challenges (PMS MTC)'.

At the suggestion of the SPREP Secretariat, the meeting deferred detailed discussion of the twenty-one individual country reports encouraging each country Director to review their own national report and provide the Secretariat with any suggested changes before the end of August. The Secretariat informed the meeting that all draft reports from the PMSNAP would be published by SPREP as part of a multi-volume set, subject of funding.

Following the overview presentation by Mr Ram Krishna, the meeting engaged in a discussion of priorities related to the projects proposed as a result of the Needs Analysis. The SPREP Secretariat responded to a question from Niue confirming that individual countries should continue to pursue bilateral support

for projects of particular interest to them and that SPREP-led efforts to secure resources for projects identified in the Needs Analysis would complement those individual national efforts.

Fiji and other meeting participants confirmed that some of the recommended projects might best be implemented through bilateral arrangements. On the second day, Ms Joanne Laurence (AusAID) confirmed that the funding for bilateral projects is separate from regional project funding in AusAID budget allocations so competition between bilateral and regional projects for meteorological services will not be a problem. She encouraged the meeting to consider using the findings of the Needs Analysis to support requests for individual, bilateral projects as well as to help strengthen the case for regional project requests (which must compete against regional projects in other sectors such as health and environment).

Kiribati reinforced requests by the meeting chair and the SPREP Secretariat to set priorities and identify basic observing and communication systems as a high priority. Expert Team member, Mr Colin Schulz, later reinforced this view.

To facilitate the discussion, the meeting chair called on other members of the Needs Analysis Expert Team to provide their perspectives on process and recommendations. In this context, the meeting heard brief reports from the following members of the team:

- Mr Jacki Pilon (French Polynesia) highlighted the potential value of the project related to high-resolution numerical modelling;
- Mr Henry Taiki (WMO) highlighted his experience during the expert team visit to Samoa;
- Mr Garry Clarke (Meteorological Services of New Zealand, Limited) who took note of the short time frame for the Expert Team visits and urged the RMSD to supplement/revise the individual country reports with additional information;
- Ms Eileen Shea (East-West Center) highlighted the mutual benefits of direct interaction with the users of meteorological services and encouraged the pursuit of application projects identified in the Needs Analysis, particularly as they relate to enhancing the application of seasonal-to-interannual climate forecasts;

- Mr Colin Schulz emphasised the importance of communications to both deliver observations to forecasters and deliver forecast information back to affected communities and sectors;
- Mr Rajendra Prasad (Fiji) reinforced earlier comments about the enthusiasm with which the user communities welcomed the interaction facilitated by the Needs Analysis and provided some specific examples of how the value of enhanced climate information for forestry and tourism; and
- Mr Lefale who highlighted the importance of facilities improvements/upgrades to the weather service building in Tonga, noted the importance of seasonal-to-interannual climate forecasts for fisheries interests (tuna cannery) in American Samoa, the emergence of advanced observational capabilities on Nauru thanks to the DOE/ARM program, recent improvements in forecasting in Samoa and American Samoa since 1998 when both services agreed to issue a single forecast; and the importance of seasonal-to-interannual forecasts and severe weather warnings to users for all of the users in his areas of study.

During the discussion, Mr Rishi Raj, WHO Hydrology Expert, noted that hydrological services and the concerns of users in water resource management were not fully developed in the regional synthesis report despite the fact that extreme events such as flooding and drought were identified in a number of individual country reports. The meeting discussed the history of planning for the Needs Analysis and noted the decision to limit the focus to meteorological services in part because a similar effort related to hydrological services in the region was under way separately under the auspices of WMO. The proposed Pacific HYCOS, a WMO regional initiative in Hydrology and Water Resources, has potential for meteorological data capture as presented in the GCOS Workshop, which preceded the RMSD meeting. Mr Raj noted that small island countries might benefit from maximising the use of limited resources by encouraging collaboration.

Dr John Low (Forum Secretariat) expressed the view that broadening the scope of the report to cover other sectors (e.g., hydrology, forestry, agriculture, and fisheries) would be good. He also noted, in this context, the benefits and importance of collaboration with other Council of Regional Organisations in the Pacific (CROP) agencies with appropriate mandates in those additional areas.

The meeting agreed that closer collaboration between meteorological and hydrological services would benefit both communities as well as improving the ability of national services to meet the needs of important users. This is in line with the recommendations of the last RA V meeting in Bali, Indonesia. Following a suggestion offered by Ms Eileen Shea (East-West Center), the meeting acknowledged that the detailed design and implementation of some of the specific projects identified in the Needs Analysis (particularly those involved in enhancing the application of climate information) could offer significant opportunities for collaboration among the meteorological and hydrological services and scientific communities in the region.

Discussion of the Needs Analysis continued on the second day of the meeting with each country invited to provide their views on priorities for the projects identified in the regional synthesis report.

Dr John Low (Forum Secretariat), Dr Richard Hagemeyer (US National Weather Service) and Mr Ram Krishna (Needs Analysis Team Leader) each offered some thoughts on meeting the challenges of setting priorities, including: synthesizing the rankings identified by individual countries; undertaking a two-step process that first categorises projects into High, Medium and Low priority and then ranking within those three categories; taking into account immediate needs, ease of implementation, and balancing benefits associated with new improved products with costs. The meeting was also encouraged to be mindful of ongoing operating costs when ranking projects. Table 1 of the PMSNAP report presents an overview of the priority ranking and the following provides a brief summary of each country's views.

The Federated States of Micronesia noted the importance of Strengthening Observing Systems (Project 1) and, in the area of Improving Severe Weather Warnings (Project 3), FSM specifically pointed to Project 3.1.6 and requested that it be broadened to include landslides (as well as flood and droughts). FSM also indicated that they would be submitting specific revisions/corrections to the text of their individual country report.

After noting the need to amend the Table on Page 9 of the report, the Cook Islands representative placed a high priority on Strengthening Observing Systems (Project 1), with special emphasis on Project 1.2, Provision of Data Collection Platforms (DPC). Strengthening

Telecommunications Network (Project 2) was also considered to be of vital importance with Project 2.4, Regional Pacific Intranet, identified as a top priority in this area.

Kiribati highlighted Strengthening Observing Systems (Project 1) as a top priority along with Strengthening Telecommunications Networks (Project 2). Kiribati also noted the importance of Improving Severe Weather Warnings (Project 3) and Climate Data Management, Analysis and Applications (Project 4). In all of these areas, Kiribati noted the importance of adequate buildings and basic facilities.

Nauru reminded the meeting that while they do not, at this time, have a national meteorological service, they are fortunate to have a number of advanced observing systems including an EMWIN system, a NOAA observing tower, an NTF tide gauge, and instrumentation associated with the US Department of Energy ARM program. Nauru identified training for both observing system staff (Project 1.4) and meteorological training (Projects 3.1, Human Resource Development) as their top priority.

American Samoa recommended some specific corrections to the text of the report including the use of appropriate terminology (e.g., tropical cyclone versus cyclone) and clarifying that the AWS systems were installed in American Samoa after Tropical Cyclone Ofa but before Tropical Cyclone Val. American Samoa provided the meeting with an update on responses to some of the issues raised in the expert team visit and report, including: expanding forecast delivery to three times per day; working with local television and radio; initiation of three-to five-day forecasts; and distribution and use of the quarterly Pacific ENSO Applications Centre newsletter by way of promoting the application of seasonal-to-interannual climate forecasts.

Vanuatu identified some corrections to the staff summary provided in the Vanuatu country report (two assistant forecasters (instead of three) and two technicians (instead of one). In addition, Vanuatu requested that they be added to the list of countries identified in Project 1.3 (training) and requested that Project 5.3 (Buildings and Accommodation) be adjusted to request a new building rather than renovations to the existing facility. Vanuatu recommended that in the Near-Term ('Immediate'), priority be given to Strengthening Observing Systems (Project 1) and Improving Severe Weather Warnings (Project 3).

Medium-term priorities (3–5 years) would include Strengthening Telecommunications Networks (Project 2) and Climate Data Management, Analysis and Application (Project 3). Project 5, Institutional Strengthening and Infrastructure could be considered a Longer-Term priority. Recognising the difficulties of ranking the individual sub-projects, Vanuatu offered the following perspective: highest priority in Observing Systems (Project 1) would be accorded to Projects 1.1 (Upgrading human-operated observational network); 1.4 (basic meteorological training) and 1.5 (restore and upgrade regional upper air network); within Project 2 (Strengthening Telecommunications Networks), Vanuatu would place the highest priority on 2.1 (high-frequency radio transceivers) followed by 2.4 (Regional Pacific Internet); within Project 3 (Improving Severe Weather Warnings), Vanuatu would give top priority to the training of support forecasters (3.1.2) followed by professional meteorological training (3.1.1), training in specialised tropical cyclone analysis (3.1.3) and public education and awareness of severe weather (3.1.6); in the context of Climate Data Management, Analysis and Application (Project 4), climatology training (Project 4.2) would be the highest priority followed by climate analysis and application (Project 4.1) and expanding and enhancing the prudent use of climate predictions (4.4); with Project 5.3 (new buildings and accommodation) afforded the highest priority under Project 5 (Institutional Strengthening and Infrastructure). Vanuatu also noted the importance of maintaining a Meteorology/Climatology Officer at SPREP (Project 5.1).

The representative of the United States offered no specific comments on the individual country reports for the Commonwealth of the Northern Mariana Islands or Guam and recognised that the representatives of FSM and Palau would offer their own views separately. Dr Richard Hagemeyer noted that he would be addressing Project 1.6 (high-resolution satellite imaging systems) bilaterally in those jurisdictions with US affiliations. The United States encouraged the meeting to endorse proposals to continue support for the annual RMSD meetings (Project 5.3).

With thanks to the expert team, the representative of Tuvalu expressed support for the country report and identified acquisition of a new building (Project 5.3) as the highest priority for Tuvalu. Tuvalu noted the importance of Climate Data Management, Analysis and Application (Project 4) and encouraged the meeting to recognise the importance of targeting/tailoring climate

forecast products to the needs of specific users. Improving telecommunications networks would be Tuvalu's next priority with particular emphasis on provision of high frequency radio transceivers (Project 2.1). In the area of Strengthening Observing Systems (Project 1), Tuvalu highlighted provision of data collection platforms and automated weather stations (Project 1.2); the need for a Pacific states radar (Project 1.8); and basic meteorological observer training (Project 1.4) and advanced training was highlighted under the human resource development project (Project 3.1).

The representative from Tonga extended greetings from his predecessor Mr Paea Havea and expressed his appreciation to the expert team members who contributed to the report for Tonga. The representative from Tonga informed the meeting of plans to move the Tonga NMS observational facility to the other side of the airport (to accommodate aviation needs) but indicated that the anemometer would remain in place (for fear of damage to the aging equipment). He also noted that the Tonga NMS currently operates out of a garage so that a new building/improved facilities (Project 5.3) was of particular interest to Tonga. The representative from Tonga also noted the importance of acquiring additional observational equipment (Project 2) and reinforced the importance of these improvements to the support of GCOS as discussed at the GCOS Workshop that preceded the RMSD meeting. He noted the need to provide basic meteorological observer training for staff at two of the five synoptic stations in Tonga (Project 1.4) and also noted the importance of additional training for meteorological staff as laid out in the Human Resources Development project (3.1). In summary, Tonga highlighted acquisition of a new building and additional equipment as their highest priority followed by training and communications.

The representative of the Solomon Islands thanked Mr Ram Krishna and the Needs Analysis team and expressed his gratitude to the Australia Bureau of Meteorology for their assistance in provision of the telecommunication link between Melbourne and Honiara. Project 5.3 was identified as a priority, in terms of Institutional Strengthening Including Infrastructure Support (Project 5), on a national level, and requested that the project text be amended to include a new building rather than refurbishing. Also identified as priorities are: Strengthening Observing Systems (Project 1), on a regional level, restoring and upgrading human-operated surface observational network (Project 1.1);

provision of data collection platforms/DCP (Project 1.2), restoring and upgrading the regional upper air network (Project 1.5) and provision of high resolution satellite imaging systems (Project 1.6) are equally important. On Strengthening Telecommunications Networks (Project 2), provision of high frequency radio transceivers (Project 2.1) is also a priority. With regards to Improving Severe Weather Warnings (Project 3), professional meteorological training (Project 3.1.1) is another priority. In terms of Climate Data Management, Analysis and Applications (Project 4), climate analysis and applications (Project 4.1) and climatology training (Project 4.2) are equally important.

The representative from Samoa expressed gratitude to the members of the expert team who visited Samoa (Mr Henry Taiki, Mr Karl Turner and Mr Penehuro Lefale) for their good work on the report. In the area of Strengthening Observing Systems (Project 1), Samoa gave highest priority to marine meteorological data (Project 1.3) in recognition of the emergence of fisheries as an important sector in Samoa's economy. Basic meteorological observer training (Project 1.4) and restoring/upgrading the upper air network (Project 1.5) were identified as additional priorities in this area as was acquisition of high resolution satellite imagery (Project 1.6). Noting the importance of getting meteorological information out to the people who need it, Samoa highlighted provision of high frequency radio transceivers (Project 2.1) as the highest priority in Strengthening Telecommunications Networks. In the area of Improving Severe Weather Warnings, the representative of Samoa noted that all the projects were important but highlighted professional meteorological training (Project 3.1.1) and training of support forecasters (Project 3.1.2) as particularly important. Recalling the words of the Samoan Prime Minister and Minister of Agriculture, Forestry, Fisheries and Meteorology, the representative of Samoa noted that all of the activities identified under Climate Data Management, Analysis and Application (Project 4) were very important and, in particular, noted the value of the Regional Climate Bulletin (Project 4.3). Samoa highlighted the vital nature of maintaining a meteorology/climatology staff at SPREP (Project 5.1). Also in the area of Institutional Strengthening and Infrastructure, Samoa identified the need for a new building (Project 5.3). Samoa also suggested that the meeting consider an additional project related to development and testing of a regional rainfall model with greater resolution than is currently available.

The representative of Papua New Guinea thanked the project team for including Papua New Guinea's report in the Needs Analysis. PNG noted that NMS operations in that country fall under the management of PNG's Office of Civil Aviation. Noting that the PNG meteorological service already had a sizeable effort in climate, including a new agro-meteorology branch, the representative of PNG noted that they would pursue improvements in the area of Climate Data Management, Analysis and Application on their own. With respect to the other projects identified in the Needs Analysis, PNG gave highest priority to the provision of a local area network (Project 2.2) in the area of Strengthening Telecommunications Networks. The next highest priority would be accorded to Strengthening Observing Systems with immediate attention to the upper air network (Project 1.5) and provision of high-resolution satellite imaging systems (Project 1.6). In the area of Improving Severe Weather Warnings, PNG identified professional meteorological training (Project 3.1.1) and training of support forecasters (Project 3.1.2) as their highest priorities.

The representative of Palau thanked the representative of the United States for his commitment to provide high-resolution satellite imaging systems (Project 1.6) which Palau had identified as an important project. Noting that the Palau NMS will soon have the benefit of a new meteorologist (currently in advanced training in Guam), the representative of Palau emphasised the importance of climatology training (Project 4.2) for his country. Palau provided their endorsement for the other projects and priorities identified in the Needs Analysis. With thanks to the Needs Analysis team, the representative of Palau provided the meeting with a status report on a number of other items of interest including: the soon-to-be-completed major renovation of the Palau NMS building and equipment; the acquisition of an EMWIN system and Automatic Weather Station (AWS) system for the southernmost island; a pending request to AusAID for a SEAFRAME station; and the pending request for support under the PICCAP programme.

The representative of Niue acknowledged the assistance of the MetService New Zealand Ltd (Mr Garry Clarke and Mr Tony Veitch in particular) for their contributions to the Niue report and also expressed his gratitude to the entire Needs Analysis team and to AusAID for their support of the project. The representative of Niue indicated that he has provided the SPREP Secretariat with some specific revisions to the text of the Niue report. In the category of Strengthening Observing

Systems, Niue summarised their priorities as follows; first priority to restoring/upgrading human-operated surface observational network (Project 1.1); second priority to technical maintenance backup (Project 1.9); followed by the lightning detection system (Project 1.7); and provision of data collection platforms (DCPs) (Project 1.2). In the category of Strengthening Telecommunications Networks, Niue identified provision of EMWIN (Project 2.3) as their first priority; regional Pacific intranet (Project 2.4) as their second priority; and provision of a local area network (Project 2.2) as their third priority. In the area of Climate Data Management, Analysis and Application, Niue identified professional meteorological training (Project 3.1.1) and training of personnel in aviation awareness (Project 3.1.5) and public education and awareness on severe weather (Project 3.1.6) as high priorities. In the category of Climate Data Management, Analysis and Application, Niue identified climatology training (Project 4.2) as their first priority followed by climate analysis and applications (Project 4.1) and the Pacific Regional Climate Bulletin (Project 4.3). In the area of Institutional Strengthening/Infrastructure, Niue identified continuation of the SPREP Meteorology/Climatology Officer as their top priority followed by continuation of the RMSD meetings (Project 5.2) and improvements to building and accommodation (Project 5.3).

The New Zealand representative deferred to his colleagues' comments on priorities. The meeting received with great appreciation the news that Mr Garry Clarke had recently been selected for the award as the most enthusiastic supporter of meteorological services in New Zealand.

New Caledonia, French Polynesia and the Republic of the Marshall Islands offered no further input on the Needs Analysis beyond their previous contributions.

The representative of Australia identified a number of important issues related to implementation of the recommendations in the Needs Analysis. Noting that taking the next steps will be challenging, the representative of Australia noted the importance that donors will place on seeing lasting results. The representative of Australia took particular note of the vital importance of education and training as an integral part of implementing the programme of action identified by the Needs Analysis. The representative of Australia offered his views on the importance of continuing the RMSD meetings – either annually or

every two years with a smaller meeting in the intervening year (Project 5.2). The representative of Australia also stressed the importance of making strong efforts in the coming years to articulate the benefits to meteorological services to the governments of the region and to raise the visibility of both the benefits of the national meteorological services and their requirements.

Ms Joanne Laurence of AusAID acknowledged the words of thanks that had been extended for AusAID's support of the Needs Analysis project and expressed her gratitude for being privileged to help with this important effort. AusAID confirmed that they will consider very seriously the requests for support that emerge in response to the Needs Analysis and will take note of the priorities identified by this meeting.

Following the individual country statements on the Needs Analysis, the meeting discussed and strongly endorsed the continuation of the position of Meteorology/Climatology Officer at SPREP as their highest priority. In this context, the meeting took note of the importance of a continued SPREP role in coordinating the development of projects and funding proposals in response to the Needs Analysis as well as the importance of continuing to support the work of the RMSDs both individually and collectively.

The meeting endorsed the draft PMS: MTC report and recommended that the SPREP Secretariat finalise the report as soon as possible and seek funding for its implementation.

4. Progress reports

4.1 WMO Sub-regional Office for the South-West Pacific progress report (agenda item 4)

Mr Taiki, Programme Officer for the office, introduced this agenda item. Mr Taiki's report is reproduced as Annex IX to this report.

The meeting received and approved the report on the activities of the WMO Sub-regional Office for the South-West Pacific provided by the Office Director, Mr Henry Taiki. Mr Taiki began his presentation by confirming WMO's commitment to working jointly with SPREP and to complement the meteorology and climate activities of SPREP. Mr Taiki also encouraged WMO and SPREP member countries to contact his

office and welcomed guidance on how the Sub-regional Office can best be of assistance in the region. The presentation on the activities of the WMO Sub-regional Office for the South-West Pacific highlighted the following items: efforts to assist WMO members in the Pacific island countries; establishment of a Memorandum of Understanding (MOU) with SOPAC in the fields of water resources, renewable energy, mitigation of natural disasters, environment monitoring, physical oceanography, human resource development and information technology in the South Pacific region; missions to Member countries and participation in the development of the Strategic Action Plan for the Development of Meteorology in the Pacific Region; participation in the Pacific Meteorological Service Needs Analysis and the Pacific Islands Conference on Climate Change, Climate Variability and Sea Level Rise as well as a number of other meetings on topics of relevance to the region; support to Tonga and Papua New Guinea for installation of the EMWIN system and coordination of assistance through WMO/Voluntary Cooperation Programme (VCP) for computer equipment in Cook Islands, Solomon Islands and Samoa; and efforts to enhance appreciation for regional issues among the leadership of WMO. Mr Taiki also highlighted a number of upcoming WMO Workshops including the November/December 2000 CLIPS Training Workshop in Auckland, NZ and the 8th Session of the Tropical Cyclone Committee in September 2000 in Rarotonga.

Following Mr Taiki's presentation, Niue expressed appreciation for WMO's decision to locate the WMO Sub-regional Office in Apia and expressed his thanks to the Government of Samoa for hosting the Office. The Cook Islands acknowledged the assistance of WMO and the Sub-regional Office in getting support from the WMO/VCP programme. The meeting also took note that because of the MOU with SPREP, the WMO Sub-regional Office can also assist non-WMO Member countries.

The representative of Fiji encouraged consideration of the possibility of joint sponsorship by SPREP and WMO of future meetings related to meteorology in the region. Mr Rishi Raj requested that the WMO Sub-regional Office provide assistance in encouraging countries to appoint hydrological advisers to their Permanent Representatives. Fiji requested that future reports from the WMO Sub-regional Office include information on upcoming activities to highlight opportunities or requirements for national participation and/or contributions.

Discussion of this item concluded with some exchange of views on the importance of providing summaries of weather and climate information in forms that are easily understood and useful to policy-makers. The meeting agreed that this was a responsibility shared by both scientific organisations (like IPCC) and the RMSDs, PICCAP coordinators and other responsible parties within countries.

4.2 Draft Island Climate Update (ICU) (agenda item 4)

The meeting welcomed the presentation by Mr Jim Salinger on seasonal-to-interannual climate forecasting and NIWA's efforts to produce a prototype Island Climate Update (ICU) – a regular newsletter to provide Pacific island countries with seasonal to inter-annual climate information. The ICU would complement the Pacific ENSO Applications Center's (PEAC) quarterly newsletter that covers the jurisdictions in the North Pacific. NIWA developed the draft ICU in response to a request made at the Rarotonga Workshop on Climate Change, Climate Variability and Sea Level Rise. The SPREP Secretariat reminded the meeting that ICU was developed in the context of discussions at the 1997 Directors meeting when the idea of a regional climate bulletin was first raised. In addition to the NIWA draft ICU, the meeting was reminded that the Australian Bureau of Meteorology (BOM) has also developed a draft South Pacific Seasonal Outlook that has been issued for review by the Directors (and other interested parties) for the past two months. The SPREP Secretariat encouraged the Directors to provide their comments on the draft NIWA ICU and noted that support for the Pacific Climate Bulletin was being considered in the context of ongoing discussions with the Italian Government.

4.3 The Government of Italy (agenda item 4)

A subsequent presentation by Dr Sergio Castellari (National Institute of Geophysics, Italy) provided further details on plans for support of a Pacific Regional Bulletin and Climatology Training in the context of an emerging Italian Cooperative Programme Towards the Small Islands of the Pacific Region. After providing some background on his home institution, Dr. Sergio Castellari summarised the rationale for the Cooperative Programme by noting that Pacific islands are located in a geographic area sensitive to extreme adverse shifts in

weather patterns (tropical cyclones, floods and droughts), climate change and variability largely associated with the El Niño and La Niña phenomena. He stated that such weather patterns have significant implications for activities like agriculture, fishing and tourism on which these countries depend. He reminded the meeting of the 1997 recognition of the urgent need to establish a Regional Climate Bulletin in order to disseminate climate information and prediction services to all users. Dr Sergio Castellari described the two goals of the Italian programme: (1) creation of a monthly Pacific Regional Climate Bulletin and its hardcopy and web distributions; and (2) the training of one technical operator (at SPREP) delegated to prepare and distribute the Bulletin. Dr Castellari then informed the meeting of discussions this week with NIWA and Australia BOM and noted the emergence of a collaborative arrangement between the Italian Ministry of Environment, SPREP, BOM and NIWA through which the Italian Government will support the production of both the BOM South Pacific Seasonal Outlook and the NIWA Island Climate Update as complementary elements of a Pacific Regional Climate Bulletin effort. In addition, Dr Sergio Castellari reminded the meeting of the commitment of his own home institute (the Italian National Institute of Geophysics) to provide seasonal forecasts of the Pacific region to support the Bulletin effort. In response to questions, Dr Castellari indicated that the initial programme would provide 18 months of support but confirmed that the Italian Government recognises the need to maintain a regional Climate Bulletin capability in the long term. In response to a query from Fiji, Dr Castellari also informed the meeting of the Italian Government's commitment to support training and education efforts as part of a larger commitment to small island states (and the Pacific region).

The SPREP Secretariat informed the meeting that they hope to launch the Pacific Climate Bulletin activity at the October 2000 meeting in Guam.

4.4 The US DOE ARM Program Presentation (agenda item 4)

The SPREP Secretariat extended deep regrets from Mr Bill Clements (US Department of Energy, ARM Program) who was unable to attend the meeting due to other commitments. The SPREP Secretariat then provided the meeting with a few highlights of the ARM project activities since the last meeting, including:

completion of the necessary actions to ensure that data from the DOE ARM sites in the tropical Western Pacific are provided on the GTS; issuance of an ARM video titled 'Clouds of Change' describing the programme in the tropical Western Pacific; and observational support provided to Nauru and Niue through the ARM programme.

4.5 The South Pacific Sea Level Rise Project (agenda item 4)

Dr Wolfgang Scherer (National Tidal Facility) provided an update on the sea level programme which has been jointly implemented by NTF and SPREP. Dr Scherer reviewed some lessons learned and accomplishments noting, in particular, two issues that emerged from discussions of the project at the Rarotonga Meeting on Climate Change, Climate Variability and Sea Level: (1) the importance of addressing changes in sea level associated with climate variability (such as significant changes associated with El Niño); and (2) the need to address changes in land movement in order to ensure accurate measures of absolute sea level. Dr Scherer noted that AusAID has agreed to support Phase III of the project and that these issues will be addressed during Phase III. Acknowledging the contributions of NTF, Kiribati reminded the meeting that the project, and decision-makers in the region, remain interested in sea level implications of long-term climate change as well as issues related to variations on shorter time-scales. Following a question from Tuvalu, discussion on this topic included issues related to the complex nature of the analytical methods used for sea level trend analysis, especially during the first decade after gauge installation, and the need to present and interpret scientific findings from the sea level measurement programme into information that is easily understood and useful to decision makers.

4.6 SPREP Climate Change Programme and activities (agenda item 4)

The SPREP Secretariat provided the meeting with a brief update on the PICCAP programme noting, in particular, the recent approval of funding to continue PICCAP programmes in participating countries pending review and approval of a pending request for support of Phase II of the PICCAP programme.

4.7 Finland (agenda item 4)

Dr Raino Heino (Finnish Meteorological Institute) briefed the meeting on his government's plans to explore the possibility of establishing a cooperative programme of support for meteorological services of Pacific island countries and Finland. Dr Heino noted that the Needs Analysis provided a very good foundation for future work and should make initiatives of a cooperative programme relatively easy to start up. Dr Heino expressed the view that since the anticipated project duration would be three to five years, he suspected that the Government of Finland would be reluctant to fund activities with long-term operational costs (e.g., Strengthening Observing Systems or Improving Telecommunications Networks). On the other hand, Dr Heino indicated that some of the proposed activities identified under Project 3 in the Needs Analysis (Improve Severe Weather Warnings) and Project 4 (Climate Data Management, Analysis and Applications) offered very interesting possibilities as did Project 5.1 (support for a Meteorology/Climatology Officer at SPREP). Dr Heino also indicated that the Government of Finland might also be interested in supporting the improvement of NMS facilities although they would probably not be in a position to provide large levels of support estimated in the Needs Analysis for building construction. Dr Heino closed his presentation with thanks for being part of the Pacific community. In response to a query from French Polynesia, Dr Heino and the representative of Vaisala Pty Ltd., offered to continue to look into any mechanisms that might be available to address the problems faced by small island states (with limited financial resources) interested in purchasing the high quality Vaisala sondes. The Chair thanked Dr Heino for his contributions and the efforts of his government to support the Pacific islands.

4.8 People's Republic of China (agenda item 4)

The meeting welcomed the presentation by Mr Wang Caifang, Director General of the Department of International Cooperation, China Meteorological Administration. Mr Caifang expressed his thanks to the Government of Samoa and SPREP for the invitation and hospitality and noted his great honour in being able to participate in the RMSD meeting. Mr Caifang specifically praised the work done in completing the Needs Analysis and indicated that he would take it back and share with other interested parties in the People's

Republic of China (PRC). Mr Caifang noted that cooperation in meteorological sciences and services is important because 'the atmosphere has no boundaries' and expressed his view of the possibility of enhanced PRC support for activities in the Pacific region. Specifically, Mr Caifang noted resources available through the Foreign Ministry for satellite data retrieval equipment, installation and training. In addition, Mr Caifang noted that the Chinese Meteorological Administration has funds available as part of the WMO/VCP programme and also supports participation in training programmes and fellowships. In addition, Mr Caifang noted that the PRC has supported study tours for RMSDs to visit China in the past and hopes to be able to do so in the future. Mr Caifang indicated that he had listened carefully to the meeting's discussion of priorities, noting the need for more detailed cost information (particularly for large projects like building construction). He states that he looked forward to future discussions on the projects identified in the Needs Analysis. Vanuatu acknowledged China's support for a satellite system and expressed their gratitude for a strong history of support and collaboration between their two countries. The Chair thanked Mr Caifang for his presentation and, in particular, his indication that future study visits to China might be possible. The SPREP Secretariat thanked China for the support they provided to buy the furniture at the new SPREP Centre in Apia.

4.9 National Institute of Water and Atmospheric Administration of New Zealand (agenda item 4)

Dr Jim Salinger (NIWA) informed the meeting of a number of items of interest including: restoration of a sub-regional community climate data archive under the auspices of the NIWA Climate Division; completion of climatologies for a number of Pacific island countries; and announcement of the upcoming CLIPS Training Workshop that will be held in Auckland in late November/early December 2000. Dr Salinger noted that, for security purposes, the sub-regional data archive would also be housed at the Fiji Meteorological Service. The Chair thanked NIWA for their continued contributions to the region and, in particular, for recent NIWA support to upgrade the hydrological network in Samoa.

5. Other matters (agenda item 5)

Mr Jacki Pilon (French Polynesia) provided a brief report on behalf of Meteo France highlighting recent steps taken to respond to the request made at the last RMSD meeting. The soundings at sites in French Polynesia were increased to two per day. Mr Pilon also noted Meteo France plans to add another upper air station next year.

Mr Rajendra Prasad informed the meeting of the status of Japanese support for training programmes being coordinated by the Fiji Meteorological Service and also provided an update on discussions related to the establishment of formal arrangements for the provision of country-specific forecasts. Mr Prasad specifically requested Pacific island countries (Tonga, Cook Islands, Niue, Tokelau, Tuvalu, Kiribati) that rely on the Regional Specialized Meteorological Center (RSMC) Nadi for their forecasts and warnings to draw up formal agreements in order for RSMC Nadi to monitor and provide the services they require. Mr Prasad used the formal agreement signed between Samoa and RSMC Nadi as an example in which RSMC Nadi only provide special weather advisories for the two Samoas. The meeting endorsed Mr Prasad's proposal and urged these countries to initiate these formal agreements with the assistance of SPREP and WMO Sub-regional Office for the South-West Pacific.

Dr Richard Hagemeyer (US National Weather Service) informed the meeting that the replacement satellite for PEACESAT was now in position at 180° and that actions would begin soon to make the transition. Dr Hagemeyer assured the meeting that he did not expect any interruption in service, which, among other things, supports EMWIN. Dr Hagemeyer also informed the meeting that he anticipates accepting the first candidate(s) for the new Honolulu training programme in early 2001.

Fiji suggested that discussion of the implications of WMO Resolution 40 (on data exchange) for the region might be helpful at some point in the future. WMO indicated that the item would be on the agenda at the next RA V meeting and Dr Zillman indicated that planned committee discussions during the coming months might make discussion of this topic at the next RMSD meeting particularly timely. The meeting requested that WMO, through the Sub-Regional Office,

prepare a brief background paper that would provide some historical context and clarify the implications of Resolution 40 for the Pacific island states.

6. Date and venue for the next meeting (agenda item 6)

The meeting warmly received the letter from the Government of Niue and enthusiastically accepted Niue's invitation to host the next RMSD meeting. The meeting agreed that a meeting time similar to this year (e.g. July, August, or September) would be best. Final arrangements will be made by SPREP in consultation with the Niue government.

In recognition of significant contributions to meteorology in the Pacific region, Dr Richard Hagemeyer (US National Weather Service) presented Mr Penehuro Lefale (SPREP Secretariat) with a Special Service Award from the National Oceanic and Atmospheric Administration of the US Department of Commerce. The award reads as follows: 'US Department of Commerce, NOAA SPECIAL SERVICE AWARD, presented to PENEHURO LEFALE, CLIMATOLOGY/METEOROLOGY OFFICER SPREP, in recognition and appreciation of significant services rendered for the National Weather Service' through Mr Lefale's work on EMWIN, SPREP Meeting of Regional Directors of Meteorological Services (RMSD), in organising, supporting and working toward closer collaboration on meteorological coordination between American Samoa and the Independent State of Samoa. This was also for his work in coordinating meteorology and climatology matters for SPREP in addition to his work with the US

Department of Energy's ARM project. The meeting joined Dr Hagemeyer in expressing their gratitude for Mr Lefale's hard work and significant contributions to the region and wished him the best of luck in the future.

7. Consideration of the draft meeting report (agenda item 7)

In considering this agenda item, the Secretariat proposed that due to time constraints, the draft meeting report be looked at by meeting participants for consideration. Participants were asked to submit any changes to the Secretariat within the next two weeks. The meeting unanimously agreed to the proposal.

8. Closure of the meeting (agenda item 8)

Mr Tutangata, Director of SPREP, joined the meeting in thanking Mr Lefale for his contributions not only to the RMSD meeting but also to SPREP's broader efforts in the region. The SPREP Director expressed his view that there has been considerable progress in the shared efforts of SPREP and the RMSDs during Mr Lefale's tenure. More generally, the SPREP Director took note of the enhanced collaboration among the RMSDs, their regional partners and donors and the enhanced awareness of the region and the issues it faces. After the SPREP Secretariat expressed thanks to the Chair, the participants, WMO, SPREP staff, Aggie Grey's staff, the SPREP Director noted his expectation of greater success in the future and closed the Seventh SPREP Meeting of the Regional Meteorological Services Directors.

Annex I: Report by the SPREP Secretariat

1. Introduction

This report covers the period from the closure of the Sixth SPREP Meeting of Regional Meteorological Service Directors (6RMSD) in July 1999 to August 2000.

2. Résumé of activities

Since the last SPREP Meeting of RMSD in July 1999, the Secretariat has implemented a number of projects and initiated new initiatives, as directed by the Directors of National Meteorological Services (NMS) of SPREP member countries in their last meetings. Progress reports of activities carried out under the SPREP Meteorological and Climate Programmes are detailed under various agenda items for this meeting.

3. Review of recommendations of the Sixth SPREP Meeting of RMSD, Tahiti, French Polynesia, July 1999

Annex II details the status of implementation of recommendations of the Sixth SPREP Meeting of RMSD. Some of the major achievements since the last meeting were:

- (a) The draft Strategic Action Plan for the Development of Meteorology in the Pacific region (2000–2009), discussed at the Tahiti meeting was finalised and published in December 1999. The SDMP has been widely circulated.
- (b) The successful implementation of the Pacific Meteorological Services Needs Analysis Project (PMSNAP) by a dedicated team of experts from the Bureau of Meteorology (BOM), Australia, US NOAA National Weather Service, Pacific Headquarters, Honolulu, MetService New Zealand Ltd, Meteo France, French Polynesia, Fiji Meteorological Service (FMS), AusAID, World Meteorological Organization (WMO), and SPREP. The excellent cooperation and assistance from each

of the 22 SPREP Pacific island member countries' NMSs and their governments contributed to the success of the project. Twenty-two reports were drafted and completed by May 31, 2000 (one regional report and twenty-one national country reports), making up the '*Pacific Meteorological Services Needs Analysis Project (PMSNAP) Series*'. The PMSNAP Series is the essential item for discussion for this meeting.

- (c) Successful operations of the US Department of Energy (DOE) Atmospheric Radiation Measurement (ARM) Cloud Atmospheric Radiation Station (ARCS) in Nauru and PNG, particularly the Nauru99 campaign. The highlight for the use of the ARM data from the ARM TWP site on the scientific front was the granting of the 'Professor Dr. Vilho Vaisala Award', Fifteenth Granting, Year 2000, awarded to: *Messrs. E.R. Westwater, Y. Han, J.B. Snider, J.H. Chrumside, J.A. Shawa, M.J. Falls, C.N. Long, T.P. Ackerman, K.S. Gage, W. Ecklund, A. Riddle (all USA)* for their paper entitled: 'Ground-based Remote Sensor Observations During Probe in the Tropical Western Pacific', published in the Bulletin of the American Meteorological Society, Vol. 80, No. 2, February 1999, by the WMO Select Committee for the Award during the WMO fifty-second Executive Council in May, 2000.
- (d) The Australian Government funded South Pacific Sea Level Rise and Climate Monitoring Project (SPSLRCMP); Phase 3 was successfully completed. The Australian Government announced in April 2000 the extension of the project under Phase 4.
- (e) Major progress on implementation of the new procedures for issuance of tropical cyclone warnings for Samoa and American Samoa. The US Government announced in May 2000 the approval of more than *US\$1.5m to upgrade the Weather Office in American Samoa. SPREP co-hosted with the Samoa Meteorological Service the fourth coordination meeting between the two Samoas and the second meeting of the Samoa Upgrade

* Secretariat correction. The U.S assistance is for US\$500,000 not \$51.5m

Telecommunication Project between the two Samoas in July 2000.

- (f) Continued close cooperation between the SPREP Secretariat and WMO. However, the roles and functions of the WMO Sub-regional Office for the South-West Pacific, now operating within the SPREP Secretariat since April 1999 is still unclear and efforts are made to improve the situation.
- (g) SPREP Secretariat finally, after three years of lobbying, secured financial and human resources from various developmental and collaborating partners and institutions to develop the Regional Climate Bulletin first recommended by this meeting in 1995 (Third SPREP Meeting of RMSD, Nadi, Fiji). The draft bulletin 'The Island Climate Update' will be discussed under Agenda Item 4.
- (h) Establishment of a Special Meteorological Purpose Fund with initial funding provided by US NOAA National Weather Service (NWS), AusAID, and New Zealand Official Development Assistance (NZODA).
- (i) The successful hosting by SPREP of the Pacific Islands Climate Change, Climate Variability and Sea Level Rise Conference in Rarotonga, Cook Islands in April 2000 to develop a Pacific Islands Framework for Action on Climate Change, Climate Variability and Sea Level Rise. This will be discussed under Agenda Item 4.

4. Acknowledgements

- (a) The Director of SPREP and his staff wish to place on record their sincere appreciation to all governments, organisations and institutions, and individuals, who have contributed to the success of implementation of meteorological and climate activities of SPREP since the last meeting. SPREP would also like to take this opportunity to express its sincere thanks to its collaborating partners, in particular, WMO, the US NOAA National Weather Service (NWS), Bureau of Meteorology,

Australia, US DOE ARM in the Tropical Western Pacific Programme Office (TWPPPO) Los Alamos National Laboratory, AusAID, New Zealand Official Development Assistance (NZODA), MetService New Zealand Ltd, Meteo France, Fiji Meteorological Service and all NMS of SPREP members, for their support to SPREP.

- (b) Special thanks are due to Dr John Zillman, Director of the Bureau of Meteorology, Australia, and President of WMO, for his continued personal interests and assistance to the SPREP Secretariat in making available financial and human resources for the PMSNAP, publication of the Strategic Plan for the Development of Meteorology in the Pacific (2000–2009) and hosting the Third and Final Planning Meeting of the Team of Experts for the PMSNAP in Melbourne in April 2000.
- (c) Special thanks also goes to Mr Richard Hagemeyer, US NOAA National Weather Service (NWS), Mr John Lumsdem, NZ Met Service Ltd, and Mr Beysson, Meteo France for providing their staff for the PMSNAP project. Special thanks to the New Zealand MetService Ltd for hosting the First Planning Meeting of the Team of Experts for the PMSNAP in Wellington in January 2000.
- (d) SPREP would like to thank and acknowledge the kind support of the Government of Australia, through AusAID, who provided the funds for the PMSNAP project, without whom the PMSNAP would not have been possible.
- (e) Finally, SPREP would like to thank the members of the team of experts for the PMSNAP for their dedication and hard work to ensure the PMSNAP was completed in time.

Annex II: Status of implementation

Recommendation #	Issue	Status (as of August 2000)
4	The draft Strategic Action Plan for the Development of Meteorology in the Pacific region (SDMP), 2000–2009 Draft Terms of Reference for the Needs Analysis	Published and completed. Finalised with assistance from AusAID.
5	Special Purpose Fund established by SPREP	On-going. The Needs Analysis funds from AusAID were channelled through the Special Purpose Fund. More funds needed.
6	The WMO Executive Council – the need to effectively articulate and address the special needs of and circumstances of Pacific islands within WMO... and continued efforts to support and justify the role of the new WMO Sub-regional Office for the South-West Pacific	Active participation by the Pacific islands delegation, made up of Mr Rajendra Prasad, Mr Rishi Raj, Mr Henry Taiki and Mr Penehuro Lefale to the fifty-second WMO EC in May 2000. SPREP presented a summary report to the EC on their joint work with the WMO Sub-regional Office.
9	The WMO/SPREP Climate Prediction and Services (CLIPS) workshop resolution	A follow-up workshop is being proposed by the WMO CLIPS programme.
10	The US government training attachment programme to the Hurricane Center, Honolulu	Preparations are well under way on the training attachment. Possibility of the first intakes to take place in early 2001.
11	11.1 The EU Cyclone Warning System Upgrade Project	Project completed in March 2000. The Forum Secretariat, as Regional Authorising Officer (RAO) for the project will present the report to this meeting under Agenda Item 4.
11	11.2 AusAID assistance to National Meteorological Services in the Pacific Region	AusAID fully funded the Pacific Analysis Project (PMSNAP). See Agenda Item 3.

	Issue	Status (as of August 2000)
	11.3 SOPAC Activities in support of NMSs	SOPAC to brief the meeting on latest developments on their disaster and hydrological activities under Agenda Item 4.
	11.4 US DOE ARM Program in the Tropical Western Pacific	Successful provision of real time data from ARM sites made available on the GTS. Full details to be presented under Agenda Item 4.
	11.5 US NOAA Office of Global Programs support to the region	Status of assistance to be presented to this meeting under Agenda Item 4.
	11.7 Finnish Meteorological Institute's interest in support of Pacific NMSs	Dr Reino to provide update under Agenda Item 4.
	11.8 Italian Government's commitment to provide support to Pacific regional climate prediction, and information activities	A draft MOU between ISAO-CNR and SPREP for transfer of funds for the Regional Climate Bulletin will be considered and signed at this meeting. See Agenda Item 4.5 for this meeting.
	11.10 SPARCE (Schools of the Pacific Rainfall Climate Experience) Program in the Pacific region	SPARCE staff to present status of SPARCE programmes and activities for the future to this meeting under Agenda Item 4.
	11.11 International Global Change Institute (IGCI) activities in support of Pacific NMSs	On-going. Future activities to be presented under Agenda Item 4.6.
	11.12 The South Pacific Sea Level Rise and Climate Monitoring Project	Review completed in May 2000 and Phase 4 approved. Present status to be presented under Agenda Item 4.
	11.13 International Research Institute (IRI) assistance to the Pacific region	Presentation on progress of implementation of IRI activities will be given under Agenda Item 4.

Annex III: Global Climate Observing System workshop resolution



G GLOBAL
C CLIMATE
O OBSERVING
S SYSTEM

South Pacific Regional Environment
Programme (SPREP)
PO Box 240
Apia, Samoa
Tel: (685) 21929
Fax: (685) 20231
Email: sprep@sprep.org.ws

GCOS Secretariat
C/o World Meteorological Organization
7 bis, Avenue de la Paix
PO Box No. 2300, CH-1211 Geneva 2, Switzerland
Tel: +41(22) 730-8275/8067
Fax: +41(22) 730-8052
Email: gcosjpo@gateway.wmo.ch

Resolution Concerning the Improvement of Global Climate Observing Systems in the Pacific Region 14–15 August 2000, Apia, Samoa

The participants¹ in the GCOS Pacific Island Regional Implementation Workshop on Improving Global Climate Observing Systems,

Welcome:

The opportunity provided by the GCOS Secretariat in partnership with SPREP, and with the support of WMO, UNEP, IOC, ICSU, to identify ways to improve observing systems for climate and in other activities related to climate observing systems in the Pacific region.

Recalling:

1. That the Conference of the Parties (COP) to the UN Framework Convention on Climate Change (UNFCCC) has encouraged Parties to actively support capacity-building in developing countries to enable them to collect, exchange, and utilise data to meet local, national, regional, and international needs (Decision 14/CP.4), and has recognised the need to identify priority capacity-building needs related to participation in systematic observation (Decision 5/CP.5);

2. That the COP to the UNFCCC has determined that the Global Environment Facility (GEF) should provide funding to developing countries to build capacity for participation in systematic observational networks to reduce scientific uncertainties (Decision 2/CP.4);
3. That Decision 5/CP.5 urges Parties to address deficiencies in the climate observing networks and to bring forward specific proposals for that purpose and to identify the capacity-building needs and funding required in developing countries to enable them to collect, exchange, and utilize data on a continuing basis in pursuance of the UNFCCC; and
4. The role and importance of the Global Climate Observing System (GCOS) to facilitate systematic observation regionally.

¹ American Samoa, Australia, Cook Islands, Federated States of Micronesia, Fiji, French Polynesia, Guam, Kiribati, Marshall Islands, Nauru, New Caledonia, New Zealand, Niue, Palau, Papua New Guinea, Samoa, Tonga, Tuvalu, USA, Vanuatu, Solomon Islands, World Meteorological Organization (WMO), Intergovernmental Oceanic Commission (IOC) Perth Office, Food and Agriculture Organization (FAO), Forum Secretariat (FORSEC), South Pacific Applied Geoscience Commission (SOPAC), South Pacific Regional Environment Programme (SPREP), Global Climate Observing System (GCOS) Secretariat, East West Center, Hawaii, National Tidal Facility (NTF), Flinders University, Australia.

Recognising:

1. That Pacific island countries are considered among the most vulnerable to the consequences of human-induced climate change, in particular, global warming and the potential threats associated with extreme weather events and sea level rise;
2. That improved observations of climate will enable provision of information and forecasts which will greatly assist the governments and national communities of member countries to prepare for the season to season and year to year variations of climate associated with El Niño and other natural phenomenon, as well as to detect and be better prepared for long term human-induced climate change;
3. That Pacific island countries currently face significant challenges associated with natural climate variability, including droughts, tropical cyclones, floods, sea level variations, and changes in ocean temperature;
4. That oceanic and atmospheric circulation patterns and ocean–atmosphere interactions in the Pacific play dominant roles in determining global patterns of climate change and climate variability;
5. That measurements of meteorological/ atmospheric, oceanographic, and terrestrial variables in Pacific island settings provide essential data for detecting and attributing climate change; for monitoring, understanding and predicting climate change and climate variability; for developing strategies to ameliorate the potential harmful effects of climate change and climate variability; and for advancing sustainable development globally; and
6. That the basic observation networks of National Meteorological and Hydrological Services (NMHSs) provide the foundation on which the strengthening of GCOS must be built.

Encourage:

1. The countries of the region to support their NMHSs to prepare national reports on activities related to systematic observation, as invited by the Parties to the UNFCCC in Decision 5/CP.5.

Urge:

1. That a regional Action Plan be prepared to form the basis for the preparation of proposal(s) for funding improvements in observing systems for climate and in other activities related to climate observing systems in the Pacific region;
2. That the Action Plan be prepared in accordance with the following programme:
 - (a) Within the next 3 to 4 months, SPREP members will develop initial reports on national requirements and priorities for improving observing systems for climate. These reports should be developed through coordination between NMHSs and PICCAP country teams, where appropriate, and could take advantage of the current opportunity associated with the incremental funding recently provided by GEF to continue PICCAP programme in participating countries. *All* SPREP members should strive to develop these reports in the context of national implementation programmes pursuant to the UNFCCC guidelines and make use of the ‘elements’ paper prepared by the workshop, as well as guidelines contained in the FCCC/CP/1999/L4/Add.1 and submit them to SPREP.
 - (b) Upon receipt of these reports, SPREP will develop a consolidated report on regional requirements and priorities and for improving observing systems for climate. This report will be submitted to SPREP members for approval.
 - (c) In cooperation with the Council of Regional Organisations in the Pacific (CROP) and the co-sponsors of GCOS, SPREP will facilitate the development of a Pacific GCOS Action Plan that will incorporate the priorities raised in the country reports, such as those in the initial National Communications, the SPREP-led Pacific Meteorological Services Needs Analysis Project (PMSNAP), and the outcomes of the Pacific Islands Conference on Climate Change, Climate Variability and Sea Level Rise held in Rarotonga, Cook Islands, April 3–7 2000 and the findings of the Pacific

Islands GCOS workshop held in Apia, Samoa, August 14–15, 2000. In order to take advantage of opportunities to report to the UNFCCC, this regional Action Plan should be completed no later than June 2001 and, if possible, presented to the Seventh Conference of the Parties (COP7) to the UNFCCC deliberations in July 2001. To facilitate this process, the workshop participants recommend the creation of a core drafting team comprised of 4–6 people from SPREP members.

Requests that:

1. SPREP and GCOS Secretariat ensure that this resolution is widely distributed within the Pacific region and with appropriate collaborating partners;
2. SPREP on behalf of SPREP Pacific Island Country members source PDF A and other resources to assist with the development of the Action Plan and related GEF proposal;
3. SPREP, representing its member countries, in consultation with other CROP organisations, use the information developed in the Action Plan to prepare a Full Project proposal to potential donors, including GEF, to fund improvements in observing systems for climate and in other activities related to climate observing systems in the Pacific region;
4. Development partners consider financing appropriate elements of the Action Plan;
5. Parties to the UNFCCC in the region and the GCOS Secretariat bring this resolution to the attention of the COP and its Subsidiary Bodies; and
6. NMHSs become actively involved in the preparation of their National reports on activities related to systematic observation, as invited by the parties to the UNFCCC in Decision 5/CP.5.

Annex IV: Opening statement by Mr Tamari'i Tutangata, Director of SPREP

SEVENTH SPREP MEETING OF REGIONAL METEOROLOGICAL SERVICES DIRECTORS (7RMSD)

Aggie Grey's Hotel, Apia, Samoa
16–18 August 2000

Mr Chairman, Distinguished Guests, Excellencies,
Ladies and Gentlemen.

Let me join the Honourable Minister, Solia Papu Vaai in extending a warm welcome to you all to the Seventh SPREP Meeting of Regional Meteorological Service Directors, especially to those who are attending this meeting for the first time.

Through you, Honourable Minister, please accept my deep appreciation and that of our members and collaborating partners to your government and the people of Samoa for generously agreeing to host this meeting at such short notice when Tonga and others were not able to host.

Before I speak on the substance of this meeting, let me firstly welcome and acknowledge the presence of the Dr John Zillman, Director of the Bureau of Meteorology, Australia and President of the World Meteorological Organization (WMO); Deputy Secretary General of the World Meteorological Organization (WMO), Mr. Micheal J.P. Jarraud; the Director General of the Chinese Meteorological Administration, Mr Wang Gaifang; Dr Raino Heino from the Finnish Meteorological Institution; Dr Sergio Casterralli, representing the Government of Italy; Dr John Low, Forum Secretariat; Mr Alf Simpson, Director of SOPAC and all other close friends of the Pacific region who have come a long way to be with us today. On behalf of our members, I thank you all for your support to the work of SPREP.

Since becoming the Director of SPREP in 1997, I had been able to attend all your meetings beginning with the fourth. Why, because I am a firm believer of the importance of your work in relation to our programmes and activities and to our region. Last year in Tahiti, I provided this meeting with a thorough assessment of the status of progress made since the 1997 Apia meeting. I think it is important for this meeting to recall some of

these key milestones that took place since then to provide us with where we are today:

1. The 1997 meeting put in place a mechanism within your Secretariat to better serve and meet your needs by introducing the long-term planning process.
2. In the 1998 meeting in Honolulu, we were able with your guidance, to collectively identify a number of key issues pertaining to further development of meteorology in the Pacific. The Honolulu meeting unanimously agreed for us to broaden our scope of work to cover meteorology and climate matters, in addition to our climate change programme. The Honolulu meeting also gave us the green light to start developing a long-term strategic action plan for the development of meteorology in the Pacific region.
3. The 1999 meeting in Tahiti adopted the draft Strategic Action Plan for the Development of Meteorology in the Pacific region, 2000–2009 and called for the implementation of the Pacific Needs Analysis Project proposed under the Strategic Action Plan.

With these clear directions, I am pleased to report to you that the state of development of meteorology in the Pacific continues to progress at a rapid pace. Since the Tahiti meeting, we have managed to fulfil our obligations as you directed us to do.

First, we have prepared a detailed progress report under Agenda Item 2 highlighting some of the major achievements since we last met. This is a follow-up on what we initiated last year for the first time in our efforts to report to you, our members in an open and transparent manner, on how we utilise the resources provided to us to assist you. I hope this report will allow you to fully assess and monitor our performance and keep you and our collaborating development partners

fully informed of progress made since the last meeting. We hope to continue this reporting process indefinitely.

Second, in June 2000, we successfully completed, with the excellent support of a team of dedicated and committed experts, the Pacific Meteorological Services Needs Analysis Project (PMSNAP), the results of which will be fully discussed under Agenda Item 3.

The completion of the Pacific Meteorological Services Needs Analysis Project is a major step forward in our continued efforts to collectively build the foundation to further the development of meteorology in the region. I would like to congratulate and thank Mr Ram Krishna and his team, as well as the main sponsors of the project, AusAID, the Bureau of Meteorology, Meteo France, MetService NZ Ltd, Fiji Meteorological Service, WMO and SPREP for completing this project on time and at minimum costs. The twenty-one draft reports are the main documents for consideration at this meeting.

While not wanting to pre-empt the discussions of the draft reports, I was struck but not surprised by the two consistent themes emerging from the analysis.

1. The majority of NMSs in the region are struggling, and often failing to provide basic services for the citizens and industries of their countries; and
2. The position of most countries regarding development programmes is that they must be sustainable within the approved in-country NMS budgets, and that assistance may be required with on-going costs. This poses a dilemma to development partners, which in the Team's experience, prefer not to be committed to any on-going costs that may be associated with the provision of technical infrastructure.

These themes can be viewed as either major challenges and or major opportunities. From SPREP's perspective, we see these two common themes as major opportunities which you, with our assistance can collectively achieve the goal of the Strategic Action Plan for the Development of Meteorology in the Pacific (SDMP) adopted last year, for all meteorological services in the Pacific region being able to provide all appropriate meteorological services to your nation through skilled and fully trained professional, technical and support personnel operating appropriate systems and working from appropriate facilities within appropriate infrastructure, and for all meteorological services in the

Pacific being able to contribute fully to the World Weather Watch (WWW) and the World Climate Program (WCP) through appropriate observing systems, telecommunications, data processing and management system and public weather services.

We would like to get your input and hopefully endorsement of the draft reports. With your endorsement, we intend, with your cooperation and assistance and that of our collaborating and development partners to seek funding from possible donors to implement the proposed projects identified in the Needs Analysis to address the problems. We look forward to your guidance and that of our collaborating and development partners to improve the reports.

But our efforts will go nowhere without your full support. With the completion of the Needs Analysis, the success of the implementation of the projects proposed and the SDMP will rely heavily on your full cooperation and of all parties involved in the development of meteorology in the region. It is your responsibility to make it work. The ownership of the projects and the plan are yours. We in your Secretariat, with assistance from our collaborating and developmental partners, are ready to assist you in implementing the SDMP.

One other issue that I would like to again bring up at this meeting is the frequency of this meeting. As I said last year, we in your Secretariat heeded your call for us to continue to provide a Forum for you to discuss issues of common interest and promote the collaboration in the development of shared solutions to common problems. However, organising and hosting this meeting annually is not an easy task. It takes time and lots of resources. You will notice that we are not able this year to provide the full services we used to provide in the past for this meeting such as French interpretation. We apologise to our French speaking members for not being able to provide this service to you due to budget constraints.

I urge you all to re-visit this issue at this meeting. You may recall that at the Apia meeting in 1997, I proposed this meeting be held biennially in light of the costs and other issues associated with having the meeting annually. However, our recommendation was not accepted then. I recommend that this meeting be held every two years beginning in 2001 and I urge you to support this recommendation. We believe having it every two years not only will allow us enough time to implement and

develop projects you requested of us but will also give you time to implement your own activities at the national level.

With the rapid developments since the 1997 meeting, we believe we have now built a sound foundation to begin working together to fulfil our mission of contributing to the economic and social benefit and welfare of our people.

In conclusion, I would like to extend our deep appreciation to you and all of our collaborating and development partners for the assistance and support given to us since 1997. As I alluded to above, we are now beginning to move more confidently towards longer term planning of climate activities generally and to weather/meteorological activities in particular. We especially thank our collaborating partners, in particular WMO, for your continued support in our efforts to strengthen the capacity of NMSs.

I should also like to acknowledge the increasing assistance of the US government, through the US NOAA National Weather Service and the US Department of Energy's Atmospheric Radiation Measurement Program in funding Mr Lefale's post and other major components of our meteorological and climate programme. I also acknowledge the continued assistance of the Bureau of Meteorology, Australia and

AusAID by funding the meteorological programmes and the South Pacific Sea Level and Climate Monitoring Project. Japan has contributed significantly through the provision of the new Regional Centre in Nadi, Fiji. NZODA continues to provide much needed support. The Global Environment Facility (GEF) through the United Nations Development Programme continues to support us. Finally, I would like to thank the sponsors of this meeting and the GCOS Workshop: GCOS Secretariat, WMO, Meteo France, the US NOAA NWS, US DOE ARM program, the Bureau of Meteorology of Australia, AusAID and the management and staff of Aggie's Hotel for the excellent facilities and services provided for this meeting.

I wish you every success in your deliberations.

Soifua.

Annex V: WMO statement to the Seventh SPREP Meeting of Meteorological Service Directors

Honourable Minister for Forestry, Agriculture, Fisheries and Meteorology,
Mr Tamari'i Tutangata, Director, South Pacific Regional Environment Programme (SPREP)
Dear Colleagues,
Ladies and Gentlemen,

It is an honour and a privilege for me to address the seventh Meeting of Regional Meteorological Service Directors (RMSD). On behalf of the World Meteorological Organization as well as on my own behalf, I have great pleasure in expressing our appreciation to the Government of Samoa for hosting this meeting. I should also like to thank Mr. Tamari'i Tutangata, Director of the South Pacific Regional Environment Programme (SPREP) for the invitation extended to WMO to participate in this meeting, and to convey to you the greetings of Professor G.O.P. Obasi, the Secretary-General of WMO and his best wishes for the success of this event.

We are pleased to note that over the years since the first Meeting of Regional Meteorological Service Directors held in Port Vila, Vanuatu in October 1993, WMO and SPREP have been working very closely together in assisting the Pacific Island countries to:

- further develop their National Meteorological Services and strengthen the network for the collection and exchange of data and information;
- improve weather forecasts and tropical cyclone warnings for the protection of life and property; and
- strengthen and increase the training of personnel in various fields of meteorology, climatology and environment related activities.

This meeting of RMSD offers a valuable opportunity for directors of NMHSs to exchange views, to interact and to better coordinate their actions. Over the last years, five new Members have joined WMO namely: Cook Islands, Federated States of Micronesia, Niue, Samoa and Tonga. We are looking forward to other Pacific Island countries joining WMO and benefitting from its programmes and activities.

This Meeting is convened at the beginning of the new millennium when WMO is also celebrating the 50th anniversary of the entry into force of its Convention. For half a century, WMO has served the people of the world and the international community as the United Nations System's authoritative voice on the state and behaviour of the Earth's atmosphere, its interaction with the land surface and oceans, the climate it produces and the resulting distribution of water resources.

Some of the major challenges facing the Small Island Developing States (SIDS) in general and Pacific Island Countries (PIC) in particular include natural and environmental disasters, climate change and sea level rise, freshwater resources management and development, depletion of natural resources, land use and land degradation and tourism management. Small islands in the Pacific are scattered in huge ocean areas and meteorological and related observations are of great importance not only to the Region but also to the whole WMO community. It is essential that the national Meteorological and Hydrological Services are equipped with adequate human resources and expertise, equipment and facilities if the countries are to take up these challenges.

This meeting gives an opportunity to discuss regional and global events that affect the development of meteorology to ensure its contribution to the sustainable socio-economic development of the nations in the Region. It also offers an opportunity to review what has been achieved in the implementation of activities and what needs to be addressed for the future. In this connection, significant regional developments have taken place, particularly the strengthening of the close cooperation between WMO and the South Pacific Regional Environment Programme (SPREP). There have been a number of activities carried out by both organisations, such as the training workshop on CLIPS in conjunction with the sixth SPREP Meeting of RMSD in Tahiti in July 1999. This was followed by a training workshop in disaster management in collaboration with the South Pacific Applied Geoscience Commission (SOPAC) in Fiji, in October 1999. WMO, WHO and UNEP recently conducted a successful multidisciplinary conference in Climate and Human Health here in Apia

last month. In addition, I should not omit the WMO/GCOS/SPREP Pacific Island Regional Implementation Workshop on Improving Global Climate Observing Systems which was successfully conducted during the last two days.

WMO is looking forward to strengthening collaboration with SPREP, SOPAC and other regional organisations in all aspects of meteorology, operational hydrology, and environment-related activities for the benefits of its Members in the Region.

WMO participated actively in the Pacific Conference on Climate Change, Climate Variability and Sea Level Rise, which was held in the Cook Islands in April 2000. The Conference was an important milestone and led to the development of the draft Pacific Islands Framework for Action on Climate Change, Climate Variability and Sea Level Rise, as a basis for developing an ongoing coordinated approach to enhance the preparedness of the countries in responding to the impacts of climate change. I am also sure that you are well aware of the contribution of WMO to the formulation of the Strategic Action Plan for the Development of Meteorology in the Pacific Region (2000–2009) and the Meteorological Needs Analysis that was carried out during the past few months. I would like to assure you of WMO's support to the implementation of the Strategic Plan in support of those NMHSs in the Pacific to enable them to maintain and strengthen their basic systems for the benefit of all Members. In this regard, I would like to place on record the appreciation of WMO for the significant contributions made by development partners to the activities of the NMHSs in the Pacific.

The WMO Regional Programme provides a framework for the implementation of global WMO programmes at the national, sub-regional and regional levels. One of its main long-term objectives is to assist and support

in building the meteorological capacities of Member countries, either individually or as a group of countries, in cooperation with regional and sub-regional economic groupings and institutions and to enable the national Meteorological and Hydrological Services to play their full role in the sustainable development of their countries. Furthermore, within its overall efforts to reinforce its support to NMHSs of the Region, a WMO Sub-regional Office for the South-West Pacific has been established in Apia in the SPREP Secretariat in April 1999 to serve WMO Members in RA V (South-West Pacific). I would like to take this opportunity to reiterate our thanks to the Government of Samoa for hosting the Office in Apia and to SPREP for their continued support to the Office. I also wish to congratulate the Director of SPREP and his staff on their beautiful new Centre. I am sure that it will provide them an atmosphere and facilities supportive of their valuable work and activities. With respect to the sub-regional office, I would appeal to all Members to give it their full support. I am confident that in turn they will benefit significantly from its operation.

During the course of the meeting, you will discuss and review a number of important issues of major concern to all Members in meteorology, including climatology, environment matters, capacity building, technical cooperation, the exchange of data and products. You will also discuss the outcome of the fifty-second session of the WMO Executive Council. I would like to assure you that WMO is committed to further strengthening its collaboration with SPREP and will continue to assist its Member countries and their national Meteorological Services in the Region in every possible way. I wish the meeting every success and fruitful deliberations.

Thank you.

Annex VI: WMO Executive Council (EC) summary of the meeting report, May 2000

Our ref: S/EC-LII GENEVA, 6 June 2000

Subject: Major outcomes of EC-LII

Dear Sir/Madam,

As you may be aware, the fifty-second session of the Executive Council was held at the WMO Headquarters from 16 to 26 May 2000. It considered a number of issues of concern to the World Meteorological Organization (WMO) and the National Meteorological and Hydrological Services (NMHSs). The draft report of the Council will be shortly available under WMO home page <http://www.wmo.ch/> and the final report will be published thereafter. However, in view of the strong interest in the work of the Council shown by Members, especially at last Congress, I am pleased to provide you with highlights of some of the major outcomes of the Council immediately after its closure.

The Council addressed a number of major issues that represent challenges and opportunities for WMO and the NMHSs. In the context of the role and operation of the NMHSs, the Council proposed various measures that would strengthen their basic infrastructure and capacity to respond to evolving needs of society. The Council gave special attention to enhancing the visibility and status of WMO and the NMHSs and to further improving the appreciation of their roles and contributions by government authorities and other decision makers. In this respect, the Council called for a study on the possibility of organizing a ministerial-level conference to be held in conjunction with the Fourteenth World Meteorological Congress (Geneva, May 2003).

The Council stressed the need for further careful analysis of issues bearing on the appropriate mission and role of National Meteorological Services (NMSs) in the light of both emerging global trends and individual national circumstances. It reaffirmed that the primary role of the NMSs remains in the area of the protection of life and property. This role is in the domain of public good and in support of government responsibility for the overall well-being of their people; hence the Council reiterated that whatever form or model the NMSs takes,

it is imperative that Government financial support, directly or through 'government-as-customer' contracts, is provided to operate and maintain the required relevant basic infrastructure.

The Council also felt the need for enhanced promotion of the status and visibility of NMSs, particularly through a better appreciation of their roles by governments. In this light, it agreed to explore the possibility of organizing a WMO conference on the role of, and socio-economic benefits provided by NMSs with special attention on the participation of high-ranking governmental officials.

To: Permanent Representatives (or Directors of Meteorological or Hydrometeorological Services) of Members of WMO (PR-5675)

Cc: Hydrological Advisers to Permanent Representatives

The Council expressed concern at the widening gap between the level of relevant services provided in developed countries and those of developing countries. In view of the high level of inter-dependence among all countries, further effort should be deployed by all parties so that the concerns are appropriately addressed in all relevant regional and international fora. In addition, an enhanced strategic approach will be developed to bridge the gap in maintaining the basic meteorological and hydrological systems, especially in connection with the establishment, operation, maintenance, and enhancement of observing and telecommunication systems, particularly in the light of technological advances. The Council therefore called for effective partnership of all countries in the planning and decision making process regarding the modernization of their basic systems and the improvement of their capabilities in an affordable and sustainable manner.

Furthermore, the Council agreed on the need for an in-depth study so that the current emphasis on remotely-sensed data does not lead to a reduction in the availability and access to observational data and

products. In this regard, the Council called for closer partnership, under the auspices of WMO, between NMHSs and environment satellite operators. High priority will be given so that all NMHSs have access to satellite data, products and services.

A major focus of the Council related to the overall reinforcement of climate-related activities at national and international levels. In particular, the Council stressed the need to maintain and strengthen the network of climatological stations. The Council discussed and provided guidance on possible actions and involvement of WMO and NMHSs, in the area of climate, especially in relation to various joint programmes such as the Intergovernmental Panel on Climate Change (IPCC), the Global Climate Observing System (GCOS) and in the preparatory process for the review of the United Nations Conference on Environment and Development (UNCED) planned for the year 2002. The Council called for the continuation of the active involvement of WMO and the NMHSs in the work of UNCED-related conventions such as the United Nations Framework Convention on Climate Change (UNFCCC), the United Nations Convention to Combat Desertification (UNCCD) and the Convention on Biological Diversity.

The Chairman of the IPCC briefed the Council on the current status of the work of the Panel. At the request of the Council, a copy of the highlights of the statement of the Chairman to the Council is attached as Annex VII.

The Council devoted special attention to the future development of National Hydrological Services (NHSs) and their links with National Meteorological Services (NMSs). The Council noted the continuing evolution of the role and status of NHSs in their national and regional text. It was recognised that it would be necessary to take account of the complex administrative and economic environment in which Hydrological Services operate to ensure strengthening their relation with WMO.

In the context of the implementation of the International Strategy for Disaster Reduction (ISDR), the Council endorsed a lead role for WMO in the Inter-Agency Task Force for ISDR. In this regard, it noted that WMO is the lead agency for the ad hoc group on 'El Niño/La Niña, and climate change and variability'. It is a member of the two other ad hoc groups dealing with 'Early warning' and 'Quantification of impacts, vulnerability/risk assessment'. The Council noted the

importance of improved accuracy of monthly and seasonal predictions and their value to various socio-economic activities and in the estimation of tropical cyclone seasons. In this respect, the Council called for further strengthening of the overall warning systems of NMHSs and supported the concept of establishing emergency assistance response teams.

In order to ensure early response in the event of natural disasters and to bring the Organization closer to the Members and to further enhance its support for the development of the NMHSs, the Council appreciated the activities carried out by the Regional and Subregional Offices. In this regard, it supported the establishment of a Sub-regional Office for Asia and another for Europe. The Offices will be established within available resources and in consultation with the presidents of the regional associations concerned during this financial period.

In the area of Education and Training, the Council reviewed and approved the criteria developed by the EC Panel of Experts on Education and Training for the award of WMO fellowships under the Regular Budget (see Annex VIII) and urged for continued efforts aimed at sensitising private institutions and foundations to complement the fellowship financial resources.

As regards technical cooperation activities, the Council expressed appreciation for the efforts made by the Secretariat towards seeking further resources from funding agencies, approved a number of coordinated programmes within the Voluntary Cooperation Programme (VCP), and endorsed other measures to enhance assistance to Members. At the same time, the Council encouraged Members to establish stronger partnership with the WMO Secretariat in the development and implementation of joint projects and programmes and in the mobilization of resources from bilateral and multilateral agencies. The Council further encouraged Members to enhance the promotion of trust fund projects and the collaboration with the private sector, especially foundations and non-governmental organizations.

The Council reviewed the planning process for future WMO Long-term Plans taking into consideration WMO's vision, strategic goals and desired outcomes. Members will be invited to contribute to the planning process primarily through the regional associations and the technical commissions.

In order to ensure that all Members benefit fully from and participate in WMO Programmes and activities, and in particular in the sessions of relevant constituent body sessions, a further study will be undertaken to consider the possibility of establishing a special fund and/or other financial arrangements for this purpose.

In regards to the process of electing members of the Executive Council, the Council considered that further consultations were necessary before suitable proposals could be made to next Congress.

On financial matters the Council noted with concern the financial difficulties of the Organization arising from delayed and non-payment of assessed contributions and urged Members still in arrears to clear their dues at an early date.

A comprehensive description of the concept of Results-Based Budgeting (RBB) as applied to WMO, including a comparison between that approach and present programme and budget practices, will be made available to all Members. The programme and budget for the biennium 2002–2003, will be presented in a slightly modified streamlined format, while the submission for a specific WMO programme will use RBB methodology on a pilot basis, for the consideration of the next session of the Council.

In the light of the external factors such as globalization and market-led economies which influence the operation of the NMHSs and considering their recent rapid evolution, the Council called for a study in connection with pertinent possible changes to the WMO Convention and General Regulations.

As this year marked the 50th Anniversary of WMO, the Council expressed its satisfaction with the initiatives and events undertaken to commemorate the event, particularly during the period of the celebration of the World Meteorological Day (WMD) at both national and international levels. The Council decided that the theme for WMD in the year 2002 will be 'Reducing Vulnerability to Weather and Climate Extremes' and

the theme for the year 2003 would be tentatively 'Our Future Climate'. As you will recall, the theme for the year 2001 is 'Volunteers for Weather, Climate and Water'. The theme for the tenth IMO lecture at Fourteenth Congress in 2003 would be 'Water Resources as a Challenge of the 21st Century'.

The Council noted the increased importance being given to the use of information technology so that Members are kept informed of developments in a timely manner. In particular, documents for all relevant meetings will be increasingly available in electronic form. The possibility of broadcasting meetings held at WMO Headquarters and making accessible recordings of key events will be further explored.

The Council awarded the forty-fifth IMO Prize to Professor-Emeritus Edward Norton Lorenz of the USA. The Council also awarded the Norbert Gerbier-Mumm International Award to two scientists from China, the Professor Dr Vilho Vaisala Award to eleven scientists from the USA and the WMO Research Award for Young Scientists to a scientist from Kenya.

The fifty-third session of the Council will be held from 5 to 15 June 2001.

I hope that the above succinct report will give you a highlight of some of the major decisions of the Council and will be useful to you. In the months ahead, I look forward to working with you in the implementation of these important decisions in advancing the science of meteorology, in building the capacity and in enhancing the visibility and image of the NMHSs.

Yours faithfully,

(M. Jarraud)
for the Secretary-General

Annex VII: Highlights of the statement of the Chairman of the IPCC

1. Current and future IPCC role

The IPCC is increasingly asked to provide timely policy-relevant advice on issues of importance to the Parties to the UN Framework Convention on Climate Change (UNFCCC) and its Kyoto Protocol. The challenge to IPCC here is to preserve the scientific integrity of the IPCC process, especially the approval of the Summaries for Policymakers (SPMs). The SBSTA requests for the two special reports, i.e., Methodological and Technological Issues in Technology Transfer and Land-Use, Land-Use Change and Forestry, place the IPCC squarely at the centre of the science-policy interface because of the political dimensions of these two issues. It was not surprising that some countries tried to use the approval process of these reports to further their negotiating positions at the Sixth Session of the Conference of the Parties to the UNFCCC. However, in both cases it turned out that the final approved SPMs were consistent in tone and substance with the underlying reports, and were in fact significantly improved over the versions submitted for final government review. The scientific integrity of the IPCC process had been maintained in the end. So what should IPCC do? It should stay the course. It must remain policy-relevant and not become policy-prescriptive, and must recognise that the line dividing the two is often quite narrow and hence be ever vigilant.

2. Current state of knowledge

- (a) Human activities have significantly changed the composition of the Earth's atmosphere during the last 150 years;
- (b) The Earth's global mean surface temperature has warmed 0.4 to 0.8°C over the last 100 years; the last two decades were the warmest of the last century, and the 12 warmest years of the last century occurred since 1983; the twentieth century is the warmest century in the last 1000 years;
- (c) The spatial and temporal patterns of precipitation are changing with (1) observed increases in precipitation in mid- and high-latitudes and

decreases in the sub-tropics and (2) an increase in heavy precipitation events and a decrease in light precipitation events;

- (d) Many parts of the world have suffered major heat waves, floods and droughts during the last few years leading to significant economic losses and loss of life. While individual events cannot be directly linked to human-induced climate change, the frequency and magnitude of these types of events are expected to increase in a warmer world;
- (e) Glaciers are retreating worldwide; sea level has increased 10–20 cms over the last 100 years and Arctic ice is thinning;
- (f) The observed changes in the Earth's climate cannot be explained by natural phenomena alone, and the scientific evidence (observations and models) suggests a discernible human influence;
- (g) The recent projections of greenhouse gases and sulphur dioxide suggest that in the absence of global climate policies, their atmospheric concentrations will increase substantially. The emissions of sulphur dioxide will increase initially for a decade or two, and will then decrease significantly because of concerns over acid deposition. Under this scenario global mean surface temperatures are projected to increase by about 1–5 degrees centigrade (2–9 degrees Fahrenheit) between now and 2100, with land areas warming more than the oceans. While precipitation is projected to increase globally, many of the arid and semi-arid areas of the Earth are projected to become drier. Sea level is projected to increase by between 10 and 90 cm by 2100. Water resources, managed and unmanaged ecological systems, human health and human settlements are all projected to be impacted by climate change: arid and semi-arid land areas in Africa, the Middle East and Southern Europe become even more water-stressed than today; agricultural production in Africa and Latin America would decrease; the incidence of vector-borne diseases, such as malaria and dengue, would increase in tropical countries; tens of millions of people would be displaced by

rising sea levels in Small Island States and low-lying deltaic areas; and major changes would occur in the structure and functioning of critical ecological systems, particularly coral reefs and forests;

- (h) The social costs of inaction (i.e., adaptation costs) are quite uncertain, but are likely to be in the range of a few percent of world GDP annually, with the costs being substantially higher in developing countries. The costs of action to mitigate climate change could be lower if the full range of technologies and policies are used;
- (i) There are numerous cost-effective ways to mitigate climate change using an extensive array of technologies and policy measures in the energy supply and demand sectors;
- (j) There is significant potential to increase the uptake or decrease the emissions of carbon dioxide and other greenhouse gases through cost-effective changes in land-use, land-use practices and forestry. Policy reform, e.g., elimination of subsidies and the internalization of the social costs of environmental damage, will be essential to reduce the emissions of greenhouse gases;
- (k) The flexibility mechanisms of the Kyoto Protocol (emissions trading and project-based activities) offer the possibility of reducing greenhouse gas emissions at a lower cost than domestic reductions alone, and can lead to the transfer of environmentally sound technologies to countries with economies in transition and developing countries. Current efforts and processes to facilitate the efficient transfer of such technologies from developed to developing countries are not sufficient, but opportunities do exist to enhance the transfer of knowledge and these technologies, but will require all stakeholders to play their role;
- (l) The atmospheric residence/adjustment time of carbon dioxide, the major anthropogenic greenhouse gas, is more than a century. This means that if policy formulation waits until all scientific uncertainties are resolved, and carbon dioxide and other greenhouse gases are responsible for changing the Earth's climate as projected by all climate models, the time to reverse the human-induced changes in climate and the resulting environmental damages, would not be years or decades, but

centuries to millennia, even if all emissions of greenhouse gases were terminated; and

- (m) Enhanced research and development (understanding the climate system, quantifying the impact of climate change on ecological and socio-sectors, and energy technologies), enhanced science and technology infrastructure in developing countries, policy reform and promoting market mechanisms will be essential to address climate change, both domestically and globally.

3. Capacity building

The IPCC would be submitting a proposal through UNEP to the Global Environment Facility for targeted research and capacity-building in developing countries. The proposal, if approved, would fund 40–50 developing country academics for a 4–5 year period in Africa, Asia, Latin America and Small Island States to assess the vulnerability and adaptation to climate change. There would be adequate funding for each academic to have one or two graduate students or post-doctoral fellows and resources for data analysis or theoretical modelling. There would also be adequate funding for the experts from each region to meet annually to inter-compare data and modelling results and to participate in the preparation and peer-review of relevant IPCC assessment reports. The proposed global project would fund the utilisation of climate model projections of climate change in assessing the impacts of climate change at the regional/national scale and for developing adaptation response options assessments using a consistent methodological approach (IPCC Technical Guidelines for Assessing Climate Change Impacts and Adaptations, 1995). The results of this work could then feed into further regional/national Stage II adaptation studies as part of UNFCCC national communications and into future IPCC assessments. The IPCC would not be either the implementing or the executing agency for the project. The mandate of the IPCC is to perform assessments and not to conduct research.

Annex VIII: Criteria for the award of WMO Fellowships

1. The aim of the WMO fellowship programme is to support the education and training of qualified and suitable candidates, particularly from developing countries.
2. Both long- and short-term fellowships will be awarded but the emphasis will be on the awarding of fellowships for continuing education and training in meteorology and hydrology rather than acquisition of basic education.
3. To be considered for a fellowship, candidates must:
 - (a) Be of sound health as confirmed by their completed medical certificates;
 - (b) Be proficient in the language of study;
 - (c) Possess the required qualification and/or relevant experience for the proposed course of study; and
 - (d) Only apply for courses of study directly applicable to meteorology or hydrology.
4. In awarding a fellowship, priority will be given to candidates who:
 - (a) Come from countries with the least developed meteorological and hydrological services as well as developing countries, countries with economies in transition and countries more vulnerable to natural disasters;
 - (b) Request only partial support (e.g. when a requesting country meets the travel costs and/or the host country waives tuition fees);
 - (c) Apply for courses at RMTCs or other training institutions in their own Region;
 - (d) Apply for long-term fellowships not exceeding 18 months in duration or short-term fellowships, though long-term fellowships lasting more than 18 months may be granted in special circumstances;
5. In awarding a fellowship, account will be taken of:
 - (e) Are expected to continue to work in their country, preferably in their national Service in a suitable post on completion of the fellowship; and
 - (f) Not have been awarded a long-term WMO fellowship within the previous four years.
5. In awarding a fellowship, account will be taken of:
 - (a) Whether the candidate comes from a country that has not recently benefited from a WMO fellowship;
 - (b) The need for regional proportional balance;
 - (c) Whether the candidate has been awarded a fellowship in the past;
 - (d) The extent to which the course of study is relevant to the national development objectives and the priorities identified in the Surveys of Members' Training Requirements;
 - (e) The extent to which the nominating Member shows a clear commitment to continuing education and training by indicating a structured approach to the planning, implementation and evaluation of training activities;
 - (f) Any information available (in the Nomination Form) about the ability or commitment of the candidate to successfully complete the course of study;
 - (g) The need to practice equal opportunity policies. (See Regulation 29 (Cg-XIII) Equal opportunities for participation of women in meteorology and hydrology).

Annex IX: WMO Sub-regional Office for the South-West Pacific

1. Introduction

The WMO Sub-regional Office for the South-West Pacific (SRO/SWP) was established in April 1999, in Apia, Samoa. It operates as an integral part of the WMO Secretariat. The staff of the Office work in very close liaison with the Regional Office for Asia and the South-West Pacific and the Technical Cooperation (TCO) Department.

2. Purpose of this report

The purpose of this report is to provide a summary of activities of the Sub-regional Office for the South-West Pacific, which covers the period from April 1999 to July 2000.

3. Summary of activities

- (a) Since its establishment, the Office has maintained close liaison with Members in the subregion in particular, the Members in the Pacific island countries in order to assist them in developing their NMSs and to implement WMO scientific and technical programmes. Some countries in the subregion were visited to identify or review the requirement of their Services. The Office accomplished various tasks, including establishing working arrangements with the South Pacific Regional Environment Programme (SPREP) and United Nations institutions based in Apia. A Memorandum of Understanding (MOU) was signed between WMO and the South Pacific Applied Geoscience Commission (SOPAC) in April 2000, for the development of cooperative activities in the fields of water resources, renewable energy, mitigation of natural disasters, environment monitoring, physical oceanography, human resources development and information technology in the South Pacific region.
- (b) The staff of the Sub-regional Office has also carried out missions to Member countries and participated in the development of the Strategic Action Plan

for the Development of Meteorology in the Pacific Region (SDMP) (2000–2009). SDMP taking into account the Fifth WMO Long-term Plan (5LTP) (2000–2009) and the Regional Association V (South-West Pacific) priority areas. The staff of the Sub-regional Office assisted Vanuatu to develop its Meteorological Service Strategic Development Plan (2000–2009). The Plan was developed in joint efforts with the Australian Bureau of Meteorology.

- (c) The staff of the Sub-regional Office participated in the Pacific Meteorological Service Needs Analysis Project (PMSNAP) which undertook an in-depth review of the needs of the developing NMSs of the Pacific. The Office participated in the Pacific Islands Conference on Climate Change, Variability and Sea Level Rise, held in the Cook Islands, in April 2000; the Third Samoa Coordination Meeting – 1999–2000 Post Cyclone Tropical Cyclone Season, in Apia, Samoa, from 3 to 4 July 2000; and the Coordination Meeting on Dissemination and Backup of Operation Products, in Apia, Samoa, 5 July 2000; and the workshop on human health and climate, held in Apia, Samoa, from 25 to 28 July 2000.
- (d) Arrangement was made by the Subregional Office for the technical support through WMO/VCP (Expert Services) to Tonga and Papua New Guinea for installation of the EMWIN system which was completed in July 2000. Furthermore, the Office is coordinating with TCO in respect of the Cook Islands, Solomon Islands and Samoa requests for assistance through WMO/VCP for computer equipment.
- (e) The President of RA V, Dr Lim Joo Tick, visited Samoa, in July 1999. The Regional Director for Asia and the South-West Office in his capacity as the WMO Representative of the Sub-regional Office carried out a mission to the Sub-regional Office in April 2000.

4. Outcomes of the WMO Executive Council on Sub-regional Offices

The Executive Council reviewed the assessment report of the Sub-regional Offices and expressed its appreciation for the effective manner in which these Offices have been performing their duties. The Council recognised that from the results of the study carried out on the performance of Sub-regional Offices, these Offices had made significant contribution in support of national Meteorological and Hydrological Services (NMHSs), mainly in the area of identifications of requirements, project formulation and implementation and mobilization of resources.

The Council also noted that joint activities carried by the WMO Sub-regional Office for the South-West Pacific in collaboration with SPREP to enhance the development of the NMHSs in the region.

The Council supported the establishment of a Sub-regional Office for Asia and a Sub-regional Office for Europe, and noted the views regarding the upgrading of the Sub-regional Office for Northern and Central America and the Caribbean, in San José, Costa Rica, to a regional Office in the future.

5. RA V planned activities under the Regional Programme

Year 2000

- 8th session of the RA V Tropical Cyclone Committee, Cook Islands, September.
- Climate Information and Prediction Service workshop, Auckland New Zealand.

Year 2001

- Technical conference on management of NMHSs, Manila, Philippines.
- Meeting of RA V Working Group on the World Weather Watch Programme.
- Meeting of RA V Working Group on Climate Matters.
- Meeting of RA V Working Group on Hydrology.

6. Conclusion

WMO would like to express its gratitude to the Government of Samoa for hosting the WMO Sub-regional Office and to SPREP for the facilities provided and the support received by the staff of the Office. It invites the Members to increase their contact with the Sub-regional Office, particularly in identification of requirements and the formulation of project proposals.