

APPENDIX 6

SUMMARY REPORT OF STAR

COASTAL & NEARSHORE RESOURCES AND PROCESSES

Results of studies of resources and processes in the coastal and nearshore zone were well represented at STAR, with all of the presentations having a directly applied theme.

Five oral papers and 10 posters directly related to nearshore processes were presented at the STAR meeting.

Topics covered in the oral presentations included: metal accumulation in Suva sediments; sediment studies of Dumbea Bay, Noumea; the effects of turbidity on coral growth; coastal erosion in FSM; Pacific ostracoda and pollution monitoring; and the geochemistry and beneficiation of sediments from the Suva Reef complex.

Topics of the posters included: littoral erosion on FSM, New Caledonia and Tuvalu; dredging of nearshore sediments and their geochemistry; anthropogenic influences on lagoons; mineral and mining policies; Pacific ostracoda and pollution monitoring; ocean monitoring; and the mapping of water and sediment quality.

In addition, a number of papers in other disciplines had data or conclusions that were directly relevant to the coastal and nearshore region, again illustrating the multidisciplinary nature of STAR.

Working Group Report

John Collen - New Zealand (Chair)
Savae Latu - Tonga
Keith Crook - United States
Sung-Rock Lee - Korea
Stephen Eagar - New Zealand
Kelepi Mafi - Tonga
Bill Erb - France
Murray Maharaj - Fiji
Marie Ferland - Fiji (Vice Chair)
Gary McMurtry - United States
Dave Heggie - Australia
Bernard Pelletier - New Caledonia
Russell Howorth - Fiji
Dick Pickrill - Canada
Joel Kasarkerou - New Caledonia

Jacques Récy - New Caledonia
Yoshifumi Kuroda - Japan
Robert Smith - Fiji
Yves Lafoy - New Caledonia
Dave Tappin - England
Piers Larcombe - Australia
Toshihiko Takahashi - Japan

Members of the Coastal and Nearshore Processes and Resources Working Group discussed a range of issues, as well as reviewing the previous recommendations to Council from the meeting of the group at the 26th Annual session in 1997. They considered that many of these issues were still valid and discussion of them is included below.

In their discussions, delegates emphasised the importance of nearshore mapping. It was pointed out that during the past year there has been very little mapping in water depths shallower than 1000 m, despite the obvious importance of this zone for many reasons. In all of these discussions, the relationship of lithofacies to habitats, the interactions of sediments and water, and the growing recognition of the need for a multidisciplinary approach to research in the coastal and nearshore zone were emphasised. It was also noted that mapping in this zone can be much more laborious and expensive than the faster surveys in deeper water, and hence the maximum use of remote sensing capability is essential. It is likely that during the next few years there will be a rapid improvement in the ability of remote sensing equipment to do what was previously done on the ground. The Working Group thus noted with approval the proposal from SOPAC to purchase a shallow water swathe-mapping system and supported the proposal to proceed with airborne LADS surveys in region (as strongly recommended by the 1997 Coastal Working Group).

The Coastal Processes Working Group recognises that good sediment and water qualities are environmental and potentially renewable resources and have 'value', similar to non-renewable resources such as sand, aggregates and petroleum. Monitoring good sediment and water qualities is essential to sustainably support multiple use and apparently conflicting activities, such as urban coastal development and

nearshore fisheries and mariculture (benthic marine habitats) industries. The Group recommends SOPAC train a staff member in the use of the MIKE 21 water quality module and initiate both sediment and water process studies to collect appropriate data to input directly into MIKE 21.

Members of the Working Group were also interested in the formation of PacificGOOS and in the issues raised by the Environmental Vulnerability Index study, both of which are reported separately. Bill Erb reported on plans for a conference on CoastalGOOS in the South Pacific to be held early next year. A number of background papers will be required at the conference, to establish a basis for a sound decision on developing coastal GOOS in the region, with the rest of the conference devoted to working groups on various agreed topics. He commented on the importance of the conference including scientists, managers, policy makers and users but with an emphasis on involving people who can deliver plans, and possible pilot projects, for immediate implementation of coastal GOOS in the region. The recent conference in Noumea on Marine Benthic Habitats identified a number of monitoring requirements that should be included in the conference.

Two meetings with content relevant to coastal and nearshore processes have taken place since the 26th Session of SOPAC. These were the Marine Benthic Habitats Conference in Noumea in November 1997 and the GOOS Workshop in Suva in February 1998. Each meeting prepared a list of recommendations which will be presented to Council at this meeting. Members of the Coastal & Nearshore Processes Working Group endorsed these recommendations. The Working Group heard that SOPAC needed additional resources to fully implement the recommendations, and recommended that the possibility of providing these additional resources be investigated.

Members reviewed the recommendations of their 1997 meeting, most of which were considered to still be important; in particular, the recognition that, despite much excellent baseline research on coastal and nearshore processes that in some cases extended back many years, many fundamental scientific questions pertaining to coastal processes and resources remain to be answered.

Much of this research can be undertaken within other research institutions, as in fact happens to a considerable extent. The Working Group recommends that SOPAC continue to actively encourage such research in interested research

institutions and to develop networks of researchers and research programmes. As part of this, the Working Group recommends that SOPAC establish a fund of seeding money to help researchers establish programmes supported by their own institutions and governments and to encourage student thesis work.

The ocean water masses are very important to processes and productivity in the coastal and nearshore zone, and therefore the Working Group considered that SOPAC should continue to be involved with oceanographic research programmes in the region and to maintain access to the data acquired by these.

The Working Group noted that the lack of expertise regarding the utilisation of aggregate resources in some member nations had been partly addressed and that utilisation of these resources is now either underway or being considered in several nations. The provision of expertise is still needed, however, and many of the resources are not fully understood. The Working Group therefore recommends, firstly, that SOPAC facilitate research programmes to investigate more fully how these resources were formed and have evolved and, secondly, that environmental impact assessments and monitoring be conducted as a matter of course during any mining. The monitoring exercises should ensure that there is a full understanding of the processes driving variability in the parameters measured, especially at short timescales.

The 1997 report noted the importance to studies of coastal erosion of studies such as the monitoring of changes in the coastal and nearshore environment, and recognised that many surveys could be efficiently completed as part of SOPAC's training role. The present Working Group noted that a staff member concerned with this training had been lost, and was concerned that SOPAC not lose this particular focus.

Integral to the coastal surveying process is the necessity for continuity of records and the surveying of base sites for past and future surveys globally. The Working Group again recommends that the monitoring network should be expanded to atolls where there is no record as yet.

Finally, the Working Group discussed the difficulties caused by the extreme shortage of time to review information and to deliberate on what are very important issues. It was questioned whether in fact the Working Group reports needed to be tabled before the beginning of TAG. It was also agreed that consideration of the

present and future work programmes by STAR delegates could start well before the Annual Session if material was made available, preferably on SOPAC's website.

Recommendations:

The Coastal and Nearshore Processes and Resources Working Group

- **endorses** the recommendations to Council of the 1997 Marine Benthic Habitats Conference and the 1998 GOOS Capacity-building Workshop.
- **endorses** the proposal to proceed with airborne LADS surveys.
- **recommends** that sufficient additional resources be allocated to SOPAC to allow full implementation of the recommendations of the above two conferences.
- **recommends** that new and forthcoming programmes stress a multidisciplinary approach wherever possible.
- **recommends** that SOPAC train a staff member in the use of the MIKE 21 module and begins to collect appropriate data for input into this module.
- **recommends** that SOPAC continue to actively encourage relevant research in other research institutions and to facilitate the development of networks of researchers and research programmes.
- Related to the above, it is **recommended** that SOPAC establish a fund of seeding money to help researchers establish programmes supported by their own institutions and governments and to encourage student research.
- **recommends** that SOPAC continue to be involved with oceanographic research programmes in the region and to maintain access to the data acquired by these.
- **recommends** that SOPAC continue to facilitate research programmes to investigate more fully how aggregate resources have formed and have evolved
- **recommends** that impact assessments and monitoring be conducted as a matter of course during any aggregate mining.

- **recommends** that the staff member concerned with beach-profiling training be replaced.
- **recommends** that the coastal monitoring network be expanded to atolls where there is no record as yet.
- **recommends** that information relevant to the Working Groups be made available as early as possible (preferably on the SOPAC website) and, further, that the provision of more time for Working Groups to report be investigated.

GEOHAZARDS WORKING GROUP 1998

Paul Taylor (Australia) - Chair
Graham Shorten (SOPAC) - Rapporteur
Alan Hodges (Australia)
Jack Rynn (Australia)
Chuck Setchell (USA)
Lasarusa Vuetibau (SOPAC/Fiji)
Charles McCreery (USA)
Litea Biukoto (SOPAC)
Shane Cronin (New Zealand)
Linda Berry (Australia)
Marc Regnier (New Caledonia)
Trevor Jones (Australia)
Ken Granger (Australia)
Kazuhiro Kitazawa (Japan)
Yves Lafoy (New Caledonia)
Gabriel Kuna (PNG)

The working group emphasised that the past year had been a time when a several of the member countries had been overtaken by several major natural disasters. The working group NOTED the excellent papers presented in the STAR session.

Following some discussion the working group then **recommended** that:

1. The scope of the group should change, to reflect a wider role that includes the National Disaster Managers (NDMO's), who should be invited to participate as partners in the working group. This partnership will then help to ensure that the group can focus on the needs of the Pacific Island Countries (PIC) communities and enable the effective use of the various data sets being assembled by hazard and risk scientists.
2. SOPAC Governing Council gives full support to the development of a holistic, integrated regional community risk partnership project to determine the risk to Southwest Pacific

communities from all natural and man-made hazards, and develop mitigation strategies for those local communities, with the advantage that all partners operate under a single banner, ie. the "Pacific Regional Community Risk Assessment Project". The aim will be to reduce the loss to life, property, the environment, safe, sustainable and prosperous communities in the Southwest Pacific region by prioritising hazard, vulnerability, and collateral data collection and associated risk assessment, and identifying disaster mitigation activities, including the following elements:

- Hazard analysis and the development of warning systems
- Risk, identification and prioritisation assessment
- Mitigation Action
- Disaster Management Planning
- Community Awareness.

The features of the project would include:

- Member countries are partners in prioritising the hazards and risks, which may vary from country to country.
- GIS be used as a tool to standardise and expedite the procedure.
- The combined input of partners, ranging from the scientific through to the social aspects, is coordinated and standardised by SOPAC. It is important to emphasise that these partnerships must be developed at the inception of the project.
- National legislation is seen as a necessary outcome but that progress should not be limited by any current lack of legislation and the partnership should include working with communities to change unsuitable practice
- One of the important outcomes should be the raising of community awareness together with development of safer urban development practices.

The above integrated process has, in the most part, been developed in the case of "Volcanic Hazards and Emergency Management in the Pacific Region" which has been presented in a SOPAC Miscellaneous Report 245 (1997). This document could be referred to as a base for further development. The

Risk-GIS methodology of AGSO's Cities Project and similar methodologies being used in the Pacific Cities Project are also an appropriate model.

3. Local hazard warning or monitoring systems and instrumentation should be set up wherever possible under a set of standards specified, maintained and coordinated by SOPAC so that the systems developed can form an integral part of a future regional framework. Standardised analytical practices should also be implemented to ensure homogeneous regional database to enable effective interface with GIS.
4. The SOPAC Governing Council be asked to direct a vote of appreciation to the Japanese Government and to JAMSTEC for their considerable efforts in making available two research vessels to evaluate the tsunami hazard to the area of Sissano Papua New Guinea, at short notice.

The working group also **strongly endorses** the proposed "Evaluation of Tsunami Hazard Offshore, Aitape PNG" project proposal and urges that the SOPAC Governing Council fully supports the project.

OCEAN BASIN MINERAL RESOURCES AND TECHNOLOGY (INCLUDING SEAFLOOR MAPPING)

The Group met at 3:30 pm on Saturday 26th September, following the STAR meeting.

The following agenda was proposed:

1. Participants introduction
2. Issues on manganese nodules (Dr. David Cronan)
3. Seabed sulphides
4. Cobalt crusts
5. Phosphates
6. Methane hydrates
7. Other minerals
8. Seafloor mapping
9. Other business

Participants:

Michael Cruickshank, Marine Minerals Technology Center, University of Hawaii, Chair
 Yves Lememicien, New Caledonia University
 Jean Marie Auzende, IFREMER
 Julian Malnic, CEO, Nautilus Minerals Corporation

James Stratford, USP
David Cronan, Imperial College, London
Graeme Hancock, Division of Mines, PNG
Hiraki Kagawa, MMAJ
Nobuyuki Masuda, MMAJ
Kazuhiro Kojima, SOPAC
Shinichiro Fukushima, MITI
Alf Simpson, Director SOPAC
Keith Crook, HURL, University of Hawaii
Chris Yeats, CSIRO

Manganese nodules:

There was considerable discussion on this. David Cronan described the history of the S. Pacific program starting with the interest of the Soviet Union in the early 80s leading to the US/Aus/NZ Tripartite program, then Japanese MMAJ cruises from 1985-1989. Cronan estimated that the nodules would assuredly be mined one day but not in the near future. Auzende said that IFREMER had had 52 cruises in the region since 69. A recent study on the economic feasibility of nodule mining indicated that they were uneconomic in comparison with current terrestrial reserves and the French program had been put in a standby mode. Discussion also covered Cook Islands. It was felt that given a better system than the single bucket trawl recently proposed by the Norwegians, these deposits may be economically sustainable now. The Japanese program had not yet been consummated by at-sea tests and resources had been shifted recently to cobalt crusts and metal sulfides.

Recommendation: That TAG request additional resource and environmental surveys in the area of the Line Islands and northern Phoenix Islands for Ni/Cu rich nodules and the area west of the Cook Islands, specifically Niue for Co rich nodules, for which there are few data at present.

Sulphides:

There is currently very strong interest in sulphides throughout the region. PNG's issuance of exploration leases to Nautilus Minerals Corporation in December 1997 sparked world wide interest and comment in the press. PNG was very interested in continuing to encourage marine scientific research and commercial development and was preparing policy documents on seabed mining that could serve as models for other countries in the region. Security of tenure, or title to the deposits was the key factor in encouraging commercial development.

Director Simpson indicated that SOPAC had very kindly been offered the sum of \$10k by MMAJ to convene a workshop in PNG to look at issues related to seabed exploration licensing and national policy development, provided the money could be committed prior to 31 March 1999. PNG offered to pick up the in-country costs for the workshop and other offers were made to seek additional participant travel funds from the US Department of the Interior, or other sources. The Director also indicated that Russia had made a formal request to the ISA to seek exploration licenses for sulfides in the area. This formal request ensures that the ISA will go forward with preparing procedures for licensing, although it may take a couple of years. It was reported also that Peter Halbach, on a cruise to the Triple Junction area of North Fiji Basin has obtained samples containing as much as 30% copper. The Japanese reported that the deposits in the Okinawa trough were of interest because of their similarity to the terrestrial Kuroko deposit but they did not appear to be economic at this time. Work was being continued on their characterization but no holes had been drilled to establish their continuity in the sub-seabed.

Recommendation: That TAG inform the delegates of the workshop and request donor countries to continue to fund exploration for metal sulfides in the region and help countries establish policies and legislation which not only promote such activities but protect the interests of all parties. In this respect some consideration may be given to the issue of commercial implications of biotechnical samples from hydrothermal sites.

Phosphates:

Very little work has been done with submarine phosphorite recently except as an adjunct to Korean cruises for seamount crust delineation. RMI was interested in pursuing the development of phosphorite, particularly in the lagoons, within the country.

Recommendations: that RMI be asked if there was a priority in looking for phosphorite.

Methane Hydrates:

The increased attention being given to hydrates as an energy source, a hazard for petroleum development, and a potential factor in global climate change was discussed.

Recommendation: Requests should be made to donor countries to explore for potentially hazardous deposits of hydrates within the region, particularly those with a potential for catastrophic release.

Seafloor mapping:

No specific work was underway in this area, but some had been requested by Fiji, Tonga, and Niue in relation to continental shelf extension work. The working group should be reinstated at some stage to advise on, and monitor such activities.

Meeting was adjourned at 6:00 pm

OCEAN WORKING GROUP

Yoshifumi Kuroda, JAMSTEC
William Erb, IOC/UNESCO

The Ocean Working Group focussed on the status of the TAO/Triton Array in the equatorial Pacific, a system of deep sea oceanographic buoys deployed by JAMSTEC. There are 70 buoys (though 3 sites have been temporarily abandoned due to damage and subsequent data loss). Twenty-five of the buoys are in the SOPAC member countries EEZ's. TRITON stands for (TRI)angle Trans-Ocean buoy Network. Deployment of TRITON buoys commenced in March 1998. After intercomparison of the data, the TRITON buoys will replace the ATLAS buoys in the Western Pacific. In addition to the surface buoys, subsurface ADCP current meter buoys will be continually deployed along the equator.

The buoys measure salinity, atmospheric pressure, wind direction and speed, air temperature and humidity, and temperature of the ocean from the sea surface to down to 750 meters at ten depths. Some of the buoys also measure currents, conductivity, rainfall, solar radiation. Data and position are relayed in near real-time by ARGOS satellite to scientists around the world via the GTS and the Internet every day.

An important first step to understanding the ENSO mechanism is to undertake a study of the process of growth and dissipation of the warm pool in the western Pacific, an area where the water temperature is the world's highest, acting as an engine driving the atmosphere. The water circulation in the western Pacific may be influenced by salinity change induced by subsurface currents associated with seasonal and ENSO cycles. Surface heat and water fluxes

are also very important to study the maintenance mechanism of the warm pool.

Researchers use the data to learn how to predict future changes in the world's climate. The buoys were first deployed to learn how to predict the El Nino (ENSO) phenomenon. The data are also useful to detect ocean fronts and changes in fish migration patterns in the tropics. In addition, the data are made available to weather forecasters around the world. In the tropics, there are very few locations or ships that regularly report the weather. Measurements of the observed weather conditions are an essential ingredient in weather predictions.

The buoys also act as Fish Aggregation Devices (FADS) and, consequently, there is evidence of fishing activity around the buoys. Mooring lines and nets are frequently found on the cable.

Recommendations

1. Participants of the SOPAC annual meeting recognised that the TAO/TRITON Array will give fundamentally important oceanographic and atmospheric data for daily weather forecasts, coastal management, tourism, marine safety and fishery resource management. The real time data are of great benefit to South Pacific countries.
2. SOPAC should encourage member countries to grant blanket clearances to the TAO/TRITON project for scientific cruises to service the buoys, and conduct oceanographic and meteorological measurements in their EEZ. A blanket clearance is required to service and repair the buoys on short notice in case of damage to the sensors. The buoys are located in the EEZ of Kiribati, Tokelau, Tuvalu, Nauru, Federated States of Micronesia, Solomon Islands, Papua New Guinea and Palau. In particular, deployment of TRITON buoys will be expanded to the EEZ's of the Federated States of Micronesia and Papua New Guinea during February – March 1999. Cooperation from both countries is vital for the successful maintenance of the TRITON buoys.
3. Education about the importance of fishing fleets operating in SOPAC countries is strongly encouraged. SOPAC should continue to arrange cooperation with the Forum Fisheries Agency which is vital for contacting fishing fleets in the region.
4. SOPAC should assist the TAO/TRITON project in developing legislation or regulations to discourage fishing vessels from dam-

aging or interfering with the operation of the buoys and to protect this valuable regional resource.

WATER AND ENERGY WORKING GROUP

1. Introduction

This was the first session of the newly formed Water and Energy Working Group. At last year's session the first meeting of the Water Working Group was held and this year the Energy Unit, a new unit within SOPAC, was included into group.

Participants introduced themselves to the Working Group.

The following participants attended the meeting:

Ed Burke, SOPAC (Manager, Water Resources Unit)

Andy Butcher, SOPAC (Training Coordinator)

Clinton Chapman, Niue

Paul Fairbairn, SOPAC (Energy Coordinator, Energy Unit)

Tony Falkland, Australia (Co-Convenor)

Solomone Fifita, SOPAC (Advisor, Energy Unit)

Saimone Helu, Tonga

Christopher Ioan, Vanuatu

Vaha'akolo Palelei, Tonga

Ben Parakoti, Cook Islands

Harald Schölzel, SOPAC, Water Resources Unit (Co-Rapporteur)

David Scott, SOPAC, Water Resources Unit (Co-Rapporteur)

Lemuel Siosi, Solomon Islands

Ausetalia Titimaea, Samoa (Co-Convenor)

Donn Tolia, Solomon Islands

2. Welcome and Introduction to the Energy Unit

The Energy Unit, represented by Paul Fairbairn and Solomone Fifita, was welcomed into the newly formed group. Members of the Group acknowledged the transfer of the Energy Unit to SOPAC from the South Pacific Forum Secretariat in January 1998; and the proposal that the Energy Unit be attached to the Water Working Group in the interim until the level of interest and need for a separate working group is determined.

In considering this association the Working Group acknowledged the past Energy Unit program. It was noted that there are a number of areas of commonality between the Energy Unit

activities and those of the Water Resources Unit and supported the proposed association and inclusion of the Energy Unit. These are in particular; solar energy for water pumping, hydrological river surveys and hydropower site investigations and development, and the potential development of a hydrological, hydrographic and solar data base with the potential for expanding to cover other resources as appropriate.

3. Fundamental importance of water & role of SOPAC in the sector

Members of the Working Group from the water sector re-emphasised the fundamental importance of freshwater resources and adequate sanitation to the social and environmental well-being of the Pacific island nations of the region. The Working Group again recognised the most important and strategic role of SOPAC as a regional co-ordinator of appropriate projects and activities in the water and sanitation sector. Further, the Working Group strongly supported the continuation of SOPAC's role in this important sector through its Water Resources Unit. This was seen as particularly important as many Pacific Island countries have in recent times again experienced the devastating effects of droughts, and the need for assistance to resolve serious water shortages is a high priority with many member countries.

4. Elections

The group re-elected, as co-convenors, Ausetalia Titimaea (Samoa) and Tony Falkland (Australia). David Scott and Harald Scholzel were elected as co-rapporteurs for the meeting.

5. Review of Recommendations from Previous (1997) Meeting

The recommendations of last year's meeting, which were adopted by TAG and reported in the Proceedings of the 26th (1997) Annual Session (p82-83), were reviewed. These were discussed and, where considered appropriate, have been presented as similar or revised recommendations of the current meeting.

Due to the limited time available for the Working Group meetings, the discussion and presentation of recommendations relate only to the Water Resources Unit activities.

Significant comments during the discussion are presented below:

- Recommendations 1 and 3: The Director of SOPAC, Alf Simpson, and Ed Burke advised the Group of the uncertain future of the Water Resources Unit. The Group was informed that it was quite possible that the Water Resources Unit may have no staff within 12 months, due to budgetary problems. The WRU was second from the bottom in terms of funding support within SOPAC. The Working Group expressed grave concern about this situation, recognising the important and valuable contribution that the Water Resources Unit has made to member countries. Some additional funding had been obtained from New Zealand during the year. Continuing attempts are being made to obtain funds from other sources.
- Recommendation 2: SOPAC and the Water Resources Unit had incorporated the ideals in the Working Group's goals and strategies in SOPAC's Strategic Plan and the goals and purposes of the Water Resources Unit.
- Recommendation 4: This topic had been addressed with funding from Taiwan and New Zealand. A regional workshop on these topics is proposed for 1999.
- Recommendation 5: This topic is included in the draft 1999 Work Program. It was mentioned that SOPAC does not have in-house expertise in legislative matters but can act as a co-ordinator. A number of countries have expressed particular interest in the topic including Solomon Islands, Kiribati, Tuvalu and Niue. It was agreed that the recommendation could be broadened to cover water (not just water resources but also water supply) and sanitation.
- Recommendation 6: Given the budgetary position, it was not possible for SOPAC to fund temporary employment for member countries staff. This situation is very unlikely to change at least in the near future. However, it was stated that the Fellowship Attachment Program has been utilised by a number of the staff from member countries during the year, and that this goes partly to satisfy the aim of the recommendation.
- Recommendation 7: Collaboration with other regional and with international organisations has continued. For instance, a Memorandum of Understanding has been signed with UNESCO. The Working Group recognised the efforts of the Water Resources Unit

in this regard. It was mentioned that the Water Resources Unit (and SOPAC) should be utilised as a source of technical expertise for preparation and review of documentation (e.g. project proposals, terms of reference). A number of member countries are already using SOPAC's services in this regard.

- Recommendation 8: The first newsletter was published shortly after last year's meeting. A second newsletter is being prepared. A six month interval was seen as more appropriate than the previously recommended three month interval. It was noted that a newsletter for the Pacific Water Association was also produced by the Water Resources Unit.
- Recommendations 9 and 10: SOPAC's virtual library has been developed and reports loaded. The development of a regional database was now not seen as a priority. Rather the use of SOPAC as a back-up archive for digital data from member countries was seen as a priority by a number of member countries, for security. The Water Resources Unit agreed they could provide this service, as required.
- Recommendation 11: Attempts have been made to obtain funding for this activity from several sources, without success. A number of countries (e.g. Samoa, Niue) saw this activity as most important and efforts should continue to ensure that the recommendation is implemented.
- Recommendation 12: An update on substantive progress was provided on the nominated projects. The Working Group recognised that the Water Resources Unit was attempting to satisfy all the requirements expressed in the recommendation.
- Recommendation 13: The recommendation regarding the groundwater modelling had not been implemented but it was also seen by the Working Group that this was not a high priority, and could be deleted. However, the wider spirit of the recommendation still stands.

6. Work Program of SOPAC's Water Resources Unit

Ed Burke referred the meeting to the current and proposed work programs of the WRU in the Director's Annual Report for 1998 to Council. It was agreed that discussion on this would

de deferred to the TAG session within the Council meeting, later in the week.

7. Contribution and Discussion re the Role of the Energy Unit

Paul Fairbairn presented a brief verbal and written outline of the Energy Unit's role in SOPAC.

The Working Group noted the following reports from the Energy Unit.

- (a) Consultants report, Program Review, 1997, recommending that there was a need for an ongoing regional core energy program; and
- (b) Consultants report "Regional Energy Program – Planning and Design Study" September 1998

It is proposed that this report will be put forward to the SOPAC Annual Session for endorsement as a framework for regional energy activities in the medium term.

In addition to the proposed 1999 Energy Unit program areas already identified, the medium term program activities will be based on the Consultants report September 1998 framework.

8. Recommendations from the Meeting

The Working Group made the following recommendations concerning strategic and work program issues.

1. In view of the very uncertain future of the Water Resources Unit, due to budgetary constraints, and recognising the important and valuable contribution that the Water Resources Unit has made to member countries, SOPAC and member countries should increase their efforts to seek funding from donors to enable the Water Resources Unit to implement its work program for the benefit of the member countries.
2. recognising that the Water Resources Unit has already included in its 1999 work program a project to assist in the development of appropriate water legislation, member countries are encouraged to utilise SOPAC in a co-ordinating role to assist with review and development of appropriate water and sanitation legislation
3. the Water Resources Unit continue to publish and distribute newsletter, at approximately six month intervals, for member

countries and interested agencies which co-ordinates information on water related activities within the region and relevant activities outside the region.

4. SOPAC provide an archival service for digital data from requesting member countries.
6. the Water Resources Unit continue their efforts to co-ordinate waterwell driller training and pump maintenance scheduling and training project in order to strengthen the capacity of many member countries' groundwater agencies to effectively undertake their own drilling and pump maintenance so as to satisfy the need to adequately and sustainably develop their groundwater resources.
7. the Water Resources Unit continue to distill and disseminate the results of research projects of importance to member countries in a form appropriate to their needs.
8. the Energy Unit to note and incorporate into future programs the priority areas as identified in the Consultants Report, September 1998, and those recommendations made specifically by member countries during the Annual Session.

Summary of Main Points

- This was the first session of the newly formed Water and Energy Working Group.
- The Energy Unit was welcomed into the newly formed Working Group and noted that there are a number of areas of commonality between the Energy Unit activities and those of the Water Resources Unit . These are, in particular, solar energy for water pumping, hydrological river surveys, hydropower site investigations and development and databases.
- The Working Group re-emphasised the fundamental importance of freshwater resources and adequate sanitation to the social and environmental well-being of the Pacific island nations of the region. The Working Group again recognised the most important and strategic role of SOPAC as a regional co-ordinator of appropriate projects and activities in the water and sanitation sector. Further, the Working Group strongly supported the continuation of SOPAC's role in this important sector through its Water Resources Unit. This was seen as particularly important as many Pacific Island coun-

tries have in recent times again experienced the devastating effects of droughts, and the need for assistance to resolve serious water shortages is a high priority with many member countries.

- The Working Group expressed grave concern about the current level of funding from all sources to the Water Resources Unit, recognising the important and valuable contribution that the Water Resources Unit has made to member countries.
- The Working Group made seven recommendations concerning strategic and work program issues. Most importantly, the Working Group urged SOPAC and member countries to increase their efforts to seek funding from donors to enable the Water Resources Unit to implement its work program for the benefit of the member countries.

REPORT ON THE PACIFIC REGIONAL ENVIRONMENTAL VULNERABILITY INDEX STUDY

The objective of the project is to develop an environmental vulnerability index consistent with the Barbados Plan of Action and the needs enunciated by the Alliance of Small Island States (AOSIS).

Given the manner in which vulnerability indices are being used in the international arena in the assessment of their developing status it appears critical that a single vulnerability index be developed expressing both economic as well as environmental parameters as a matter of urgency. Therefore, there is clearly a need to further develop acceptable methodology and

efforts towards a composite environmental vulnerability index.

As the current Chair of Commission of Sustainable Development the New Zealand Government has funded the environmental vulnerability index project currently being undertaken by SOPAC.

SOPAC and its environmental vulnerability index study team has convened several meetings locally in Fiji in an attempt to obtain as wide a participation as possible in the process of developing a practical and acceptable environmental vulnerability index. The process has included a meeting with SOPAC staff and a session with local and regional experts from the University of the South Pacific, UNDP, Forum Secretariat and other interested non-governmental groups.

The panel discussion held during a special work group session of STAR from 6- 8pm on 26 September 1998 is an important part in this process of continually obtaining input from environmental experts. The STAR special session provided the first international forum of experts at which the concepts and possible approaches to the development of an environmental vulnerability index (EVI) study were presented and discussed.

Discussion and responses were positive with most participants supporting the objectives of the study and providing constructive input. Several important issues regarding the environmental vulnerability index computer model, the approach to data collection and issues on environmental risks and subsequent responses were also raised by participants for consideration by the environmental vulnerability index study team.