

# APPENDIX 5

## STAR REPORTS

### Introduction

STAR is SOPAC's Science, Technology and Resources Network and it acts as an interface between the SOPAC Secretariat and its member nations and the international scientific community. It does this in several ways. Every few years, an international scientific workshop or meeting is either convened by STAR, or held under its auspices, on a broad theme relevant to the SOPAC region. STAR members also correspond and tender advice during the intervening periods.

Each year, a meeting at which scientific papers are presented and discussed, and thematic Working Groups meet, is held in conjunction with the Annual Session of the SOPAC Governing Council. This year, as has been the arrangement for several years now, STAR met prior to the opening of this Council Meeting, from September 25<sup>th</sup> to 26<sup>th</sup>. The meeting was held at USP (and I thank that organisation for the use of their facilities) and was well attended, with over 100 people at some sessions.

### STAR Presentations

The theme of this year's STAR meeting was "Geoscience and sustainable development in Pacific Island States, 2002-2012".

During the meeting, 47 scientific papers were presented orally and a number of others by the posters you see displayed outside. Abstracts of these are published in SOPAC Miscellaneous Report 487.

As is usual for these meetings, the information presented covered a very wide range and participants included representatives from disciplines other than earth science. I recommend the volume of abstracts as a guide to the range of material covered and as a source of much useful information.

In deference to our hosts, the STAR Meeting commenced with a session devoted to the development and geology of Nauru and then papers were grouped into the themes of Tectonics and Geology, Hazards, Non-living Resources, Human Resources, Sea Level and Oceans, Technology and Remote Sensing, and Habitats and

Coastal. The eight sessions were chaired by John Collen, Faatoia Malele, Keith Crook, Kazu Kitazawa, Dave Tappin, Daryl Rairi, Dave Garton, John Bonato and Paul Fairburn.

Let me briefly outline the scope of the presentations for you. During the session on Nauru, speakers examined the past development of the island and the challenges ahead, its tectonic setting on the Pacific plate and, on a smaller scale, issues associated with coastline development.

During the Tectonics and Geology session, papers covered aspects of the plate tectonic geology of Hawaii and Niue, proposals for a major collaborative study of mid-ocean rises, seismic observing systems in the Pacific, and the geology of northern Viti Levu.

Hazards papers summarised recent work on tsunamis, including data supporting the origin of the Sissano Tsunamis as the result of a submarine slump, flood forecasting for the Rewa River, and landslide hazards.

The session on non-living resources included discussion of the petroleum potential of New Caledonia, the Japan/SOPAC Deep-sea Mineral Resources programme, and problems of rainfall distribution and storage on Viti Levu. One paper examined the relationship between marine research programmes and mineral exploration. In what I think was a first for STAR, human resource issues were canvassed in a paper dealing with Business and Training Needs Analysis in geoscience organisations.

The sea level and oceans sessions contained several papers dealing with monitoring past and present sea level change, and the implications of this. New mass spectrometer-based instrumentation for analysing ocean waters was described, and several papers dealt with ocean observing systems, including the Global Ocean Observing System and the Triton buoy network.

As has been the case in recent years, the applications of Information Technology permeated much of the meeting but the session specifically devoted to this concentrated both on the increasingly high resolution satellite imagery available for the region and the application of remote sensing and GIS techniques for rapid mapping for a range of purposes.

The Habitats and Coastal papers were also, as usual, wide-ranging and included general papers on issues and problems and their management, discussion of areas with specific challenges, and more specific discussions of sedimentary processes and environmental settings. As examples only, papers discussed the large volume of multibeam surveying undertaken by SOPAC throughout the region during the past year, methods of determining rates of sedimentation using <sup>137</sup>Cs isotopes, erosion problems on Tongatapu and the significance of the biological input into sedimentation, as well as commercial means of pumping sediments.

During the Energy session, papers discussed the generation of electricity from wave energy, ocean energy utilisation and biomass conversion, as well as energy efficiency and the relationship of energy use to tourism.

## Working Groups

In addition to the scientific presentations, four working groups also met. These working groups offer an opportunity for STAR delegates to bring to the attention of Council items of particular scientific and technical importance to the region.

This year the Energy, Hazards, Marine Scientific Research and Ocean and Coastal Observations, and Coastal and Nearshore Processes working groups met. I will report briefly on their main recommendations here and the full reports which contain supporting arguments for the conclusions are appended.

**The Energy Working Group** recognised the importance of energy efficiency and conservation in the region and recommended the following:

- that SOPAC treat as a priority the work on benchmarking of energy use for commercial buildings;
- that SOPAC develop partnerships with other government agencies and industry partners as the opportunity existed to share energy conservation data that could be part of the energy supply and demand database;
- that SOPAC establish best practice energy use standards for tropical climates, taking into account the cost of energy within the Pacific Island countries;
- that SOPAC disseminate widely the findings from benchmarking activities. It was recognized that it is necessary to ensure

that the information on potential energy and financial savings reaches higher authorities within the Pacific Island countries; and

- that SOPAC highlight the economic and environmental aspects of energy consumption to identify the potential for energy reductions in Pacific Island economies.

**The Hazards Working Group** reviewed the 2001 recommendations and agreed that these be carried over into 2002/3 and that the Community Risk Programme Manager seek funding opportunities when appropriate for the implementation of these initiatives.

One of the main discussions last year was on the need for an array of Pacific seismograph stations and on the proposal of the Director of Seismology at the Geophysical Institute of Israel to spend a sabbatical year at SOPAC. The WG learned that the array of stations has not been installed but reaffirmed its support for the project. The WG heard that the funding for the sabbatical had not materialised.

Other recommendations from 2001 include:

- a) That SOPAC carry out a shallow water bathymetry survey along the northern coast of Papua New Guinea to complement the deep-water surveys carried by JAMSTEC in 1999 and 2000. This will aid investigation of the transmission mechanism of the Sissano tsunami. It was also recommended that similar surveys be carried out in other areas prone to tsunami, including Mele Bay, Vanuatu and the Solomon Islands as part of co-ordinated regional program of investigation;
- b) That the Pacific Cities urban hazard and risk assessment project be extended to include Lae and Madang, PNG;
- c) That an onshore seismic reflection survey be conducted in the Lae region to test the hypothesis that Lae is located astride a plate boundary; and
- d) That continuous global positioning (C-GPS) stations be established on selected Micronesian atolls to investigate their vertical motion due to tectonic uplift/subsidence. Regarding this, the STAR presentation on the vertical tectonics of Nauru and Banaba by Loren Kroenke indicated the two islands were subject to recent tectonism.

The working group welcomed Japan's initiative in establishing a seismic network in the region in response to a previous working group recommendation. Recognising the importance to develop quickly such a network in the South Pacific it urged member countries to cooperate in integrating seismic networks and recommended SOPAC take the necessary steps to encourage the smooth exchange of seismic data.

Key recommendations of the **Marine Scientific Research and Ocean and Coastal Observations Working Group** are:

1. that multidisciplinary oceanographic research should be encouraged in the region to include more extensive marine scientific research and ocean observation and, where possible, additional resource assessment and increased coastal State country involvement and support;
2. that the merging of goals and an increase in cooperation between SOPAC coastal States and ocean researching States should be promoted;
3. that the sharing of data and information with coastal states would be improved by filling the vacant position of Marine Scientific Research Coordinator.
4. that the convening of workshops would improve understanding of the various data collected from marine scientific research cruise activities and to assess the importance of these to SOPAC member countries. As well, this would raise awareness of UNCLOS provisions with respect to marine scientific research to ensure that mechanisms for cooperation between the coastal state and the researching state are effective.
5. SOPAC should be commended for its role in developing ocean observing system initiatives, such as GOOS, in the region and it should now focus on increased involvement of SOPAC member countries in this regard. It should consider that the activity to be successful requires a dedicated professional as part of the SOPAC secretariat to coordinate planned and ongoing ocean observation activities and the function of Regional Ocean Observing initiatives.
6. The Ridge 2000 project should be endorsed by SOPAC as there are a number of potential benefits to the region at no cost. The US National Science Foundation has recently approved this new research initiative with an anticipated programme life of

twelve years and interdisciplinary studies at a small number of sites. One of those sites is the East Lau Spreading Center and collaborative opportunities to work with SOPAC scientists here are sought.

**The Coastal and Nearshore Processes Working Group** recommended

- that SOPAC continues with the work necessary to find alternate marine aggregate resources using the best technology available to SOPAC, as presented in STAR.
- That the Manihiki lagoon pearl farming project be designated a pilot project under Coastal GOOS. The rationale is that the project is intended to be continuous, producing a long-term data set and providing a useful product to the industry.
- It was brought to the attention of the working group that the Coastal GOOS Strategic Plan has been finished. It was recommended that SOPAC should explore the possibility of a seminar or workshop to present a synthesis of the strategy to the region. This should be a joint undertaking of SOPAC and the IOC to be targeted on or before the next meeting of STAR.
- It was recommended that a representative from SOPAC attend the 3<sup>rd</sup> Geohab meeting focussing on using geological mapping of the seabed with multibeam technology that is being held in Hobart in 2003.
- The working group noted that coastal erosion is still a serious issue in the coastal states and the use of high resolution satellite mapping with historical aerial photography to assess coastal change by SOPAC in Tonga and Fiji were excellent examples of how SOPAC has built up a working expertise in this area.
- The working group discussed the environmental assessment recommendation in the 2001 STAR report and proposed an amendment. It recommended that both Pacific SIDS and aid donor organisations/nations adopt as policy the standard operating practice of requiring a professional EIS for any development to be undertaken in the coastal zone and that SOPAC serve as technical reviewers of such EIS.
- Coastal zone studies and assessments should incorporate data collected from rocky shoreline sectors, which are usually by-passed in favour of beaches and estu-

aries. Rocky shorelines contain archives of extreme events and dating of these can provide a history of the incidents and magnitude of large wave events that have had major impacts on the coastal zones of SIDS.

## **STAR Business Meeting**

As already reported to this meeting, the STAR Business Meeting elected myself to continue as Chair of STAR for the coming years and Mr Faatoia Malele, Deputy Director of the Meteorology Division of Samoa, to continue as Vice-Chair of STAR.

## **General Comments from Chair of STAR**

At this point, I would appreciate this opportunity to convey some personal impressions of this STAR meeting. The first is the clearly applied direction to much of the research. This has always been a particular feature of STAR but is becoming more clearly articulated and was apparent in most presentations. It is also obvious from even a cursory glance at the posters. STAR discussions are becoming increasingly directed towards the provision of quality technical advice to member governments.

My last observation is prompted by a recent conversation with a colleague. He remarked, and I quote: "One of the reasons I trained as a scientist was a desire to help society. As a young scientist, I assumed that if I did good science, it would automatically end up in policy. But of course that didn't happen". Everyone is far too busy to automatically follow too much that happens outside their own area of expertise. If we want the results of science to be used to the full, we have to work at finding all possible mechanisms that allow the flow of information in a usable form. Without labouring the issue, I would simply like to make the point here that the STAR/SOPAC/Council interaction that brings together policymakers, planners, managers and scientists is quite unique in my experience and is something well worth nurturing.

As usual, STAR is indebted to staff of the SOPAC Secretariat for their cheerful and untiring efforts that make the meeting possible. The STAR meetings are organised over a much shorter time frame, and with fewer staff, than any other conferences with which I have been associated. The success is due to the efforts of the Secretariat. And finally, Madam Chair, may I take this opportunity on behalf of STAR to thank

our hosts, the Government and people of the Republic of Nauru, for the hospitality shown to us.

That concludes my address. Thank you.

John Collen, Chair, Science Technology and Resources Network (STAR)

Suva, 28 September 2002

## **APPENDICES**

### **MINUTES OF STAR WORKING GROUPS**

#### **I. Hazards Working Group Report**

##### *Attendees:*

David Tappin	- BGS
Lasarus Vuetibau	- Fiji Mineral Resources Department
Daisuke Suetsugu	- JAMSTEC, Japan
Kerry Stewart	- Dunlop Stewart, Auckland New Zealand
Tariq Rahiman	- Fiji Mineral Resources Department
Sakiusa Waqanisau	- Fiji Mineral Resources Department
Blair Craig	- Asia Pacific Area Network & Hawaii Synergy (NASA) USA
Alan Mearns	- SOPAC

David Tappin chaired the meeting and the minutes were taken by Alan Mearns

##### *Discussion items:*

1. The chair explained the process of the working groups
2. SOPAC discussed the new programming approach and the changes to the Hazard Assessment Unit since the last meeting in the Marshall Islands.
3. The Chair read out the report from the Working Group meeting of 2001, highlighting the main points discussed at that meeting. He also identified the talks at STAR related to the working group themes.

4. One of the main discussion of 2001 was the need to link existing arrays of Pacific seismograph stations under a common regional centre and that the Director of Seismology at the Geophysical Institute of Israel planned to spend a sabbatical year at SOPAC. The WG learned that the Regional Centre has not been established and the working group reaffirmed its support for the project. The WG heard that the funding to complement travel costs for the sabbatical had not materialised.

5. Daisuke Suetsugu made the following statement:

The sessional working group welcomed the initiative of Japan to establish a seismic network in the region in response to a previous working group recommendation. Recognising the importance to develop quickly such a network in the South Pacific it urged member countries to cooperate in integrating seismic networks for the smooth exchange of seismic data. The necessary steps have been taken by SOPAC Secretariat to gain donor funding, but none has been forthcoming.

6. The Working Group reviewed the 2001 recommendations and agreed that they be carried over into 2002/3 and that the Community Risk Programme Manager seek funding opportunities when appropriate for the implementation of these initiatives.

7. The recommendations from 2001 included:

e) That SOPAC carry out a shallow water bathymetry survey along the northern coast of Papua New Guinea to complement the deep-water surveys carried by JAMSTEC in 1999 and 2000. The shallow water survey will greatly aid in the investigation of the transmission mechanism of the Sissano tsunami. The WG also recommended that similar surveys be carried out in other areas prone to tsunami including Mele Bay, Vanuatu and the Solomon Islands as part of co-ordinated regional program of investigation.

f) That the Pacific Cities urban hazard and risk assessment project be extended to include Lae and Madang, PNG.

g) That an onshore seismic reflection survey be conducted in the Lae region to test the hypothesis that Lae is located astride a plate boundary.

h) That continuous global positioning (C-GPS)

stations be established on selected Micronesian atolls to investigate their vertical motion due to tectonic uplift/subsidence.

Recommendation 7a regarding PNG was discussed by Dave Tappin and the need for the seismic survey confirmed. The WG learned from Graham Shorten that the survey of Mele Bay was being carried out. The WG learned that for Recommendation 7b there was a strong interest PNG for Lae to be included in the Pacific Cities Project. For Recommendation 7c there has been no take-up. Regarding Recommendation 7d there was a presentation at STAR on vertical tectonics of Nauru and Banaba made by Loren Kroenke that indicated the two islands were subject to recent tectonism.

8. The link between scientific analysis and risk mitigation was discussed and the Working Group supports the proposed Community Risk Programming approach of linking scientific hazard solutions to identified CHARM risk reduction priorities.

9. Blair Craig – Asia Pacific Area Network & Hawaii Synergy (NASA) USA introduced his programme to the Working Group and requested advice as to how he could communicate the content of his programme to SOPAC and the countries. It was suggested that he talk directly with Alan Mearns, head of Community at Risk Programme.

## **II. Marine Scientific Research and Ocean and Coastal Observations Working Group Report**

Working Group Participants:

Loren Kroenke  
Peter Harris  
Bill Erb  
Chuck Fisher  
Cristelle Pratt  
Luna Wong  
Donato Roqica  
Nobuyuki Okamoto  
Toru Nakamura  
David Garton  
Faatoia Malele  
Gary McMurtry  
Robert Smith  
David Heydon  
Naomi Atauea  
Kazu Kitazawa (Chair)  
Yves Lafoy

The Working Group met to review issues related to the development of observing systems within the Pacific region under the purview of SOPAC. The key recommendations and outcome of the discussions are presented as follows:

1. Multidisciplinary oceanographic research should be encouraged in the region to include more extensive marine scientific research and ocean observation and, where possible, additional resource assessment and increased coastal State country involvement and support.

Opportunities for conducting research or observations of direct interest to member countries could be identified and expanded by enhanced communication with member states via SOPAC. There is a need for researchers coming to the region to consider regional interests and involvement. Further, with regard to marine mining issues it was acknowledged that SOPAC member countries required urgent assistance toward development of their marine mineral policies and regulations.

2. Promote the merging of goals and an increase in cooperation between SOPAC coastal States and ocean researching States.

It was considered that this could be achieved by increased reporting during STAR by researching States concerning future programs and activities to be addressed in the next several years. The present balance of presentations between those focussing on project review and those focussing on new or planned activities and research are out of balance. The planning for the next STAR agenda should take this into account

3. Improve the sharing of data and information with coastal States by filling the vacant position of Marine Scientific Research Coordinator.

The working group believes that several critical functions are lacking in this area and that a dedicated, appropriately qualified professional is needed to fill this role. Member states are not getting proper information and feedback from research cruises in the region. The coordinator could serve as an interface and assist in the interpretation of the cruise results. Also, there are instances wherein researching States encounter difficulties in identifying contacts within the coastal State to seek permission for their cruise and to enlist

proper involvement from the coastal State in their cruises. The Coordinator could address the various constraints mentioned. In addition the Coordinator could assist in promoting resource exploration, enlisting researchers to assist in identifying potentially rich resource areas and assisting member countries in pursuing sources for additional assistance in this area.

4. Convene workshops to improve understanding of the various data collected from marine scientific research cruise activities and to assess the importance of these to SOPAC member countries. As well raise awareness of UNCLOS provisions with respect to marine scientific research to ensure that mechanisms for cooperation between the coastal State and the researching State are effective.
5. SOPAC should be praised for its role in developing ocean observing system initiatives such as GOOS, in the region and it should now focus on increased involvement of SOPAC member countries in this regard. It should consider that the activity to be successful requires a dedicated professional as part of the SOPAC secretariat to coordinate planned and ongoing ocean observation activities and the function of Regional Ocean Observing initiatives. As well, the incumbent could play a key role in seeking practical ways and means to disseminate available data to SOPAC member countries for their use.

The working group noted that ocean observation networks by moored buoys and observation floats are considerably developed, but felt that more data are necessary to deepen our understanding of the ocean and to use the ocean more effectively for local benefit.

The working group regretted that no presentation was made by Member country scientists on this subject. It recognised that direct involvement by Member countries in ocean observation is difficult at this stage. However, most observed data are available on a near real time basis and capacities in analysing and utilising such data are gradually improving. Therefore, the working group expressed its hope that presentations regarding application of oceanographic data to regional benefit would be made at the next STAR session by member country scientists.

Participants from Member countries expressed their views that high communica-

tion costs and technological difficulties in the region discourage countries in using near real time data. It thanked JAMSTEC for its offer of training opportunities to utilise ocean data.

6. The Ridge 2000 project should be endorsed by SOPAC as there are a number of potential benefits to the region at no cost.

The US National Science Foundation has recently approved a new research initiative Ridge 2000 Program, proposed by US scientists. The program office opened in October 2001, with an anticipated programme life of twelve years. One theme of the program is to conduct integrated and interdisciplinary studies at a small number of sites to achieve an understanding of the links between deep-earth processes and life in the deep ocean spreading centers. Three initial sites were chosen by scientists to conduct intensive, integrated and interdisciplinary studies; one of those sites is the East Lau Spreading Center in the Lau Basin. Collaborative opportunities to work in this region with SOPAC scientists are being sought. Tongan scientists and students, as well as scientists and students from other SOPAC member countries might be directly involved in the program. Particular measurements, surveys or samples, of interest to the Kingdom of Tonga and/or other SOPAC member countries should be identified. Recognizing that this spreading center is within the Exclusive Economic Zone of the Kingdom of Tonga their permission to conduct research is required.

### III. Energy Group Working Group Report

*In Attendance:*

- (1) Tony Neil (PPA),
- (2) Artem Madatov (Sea Electrical Generators),
- (3) Frank Barram (Integrated Energy Services),
- (4) Trent Whyte (Integrated Energy Services),
- (5) Kifle Kahsai (USP),
- (6) Rupeni Mario (SOPAC),
- (7) Anare Matakiviti (SOPAC),
- (8) Yogita Chandra (SOPAC),
- (9) Paul Fairbairn (SOPAC),
- (10) Alan Bartmonavich (PIF).
- (11) Isaia Taape. (Tuvalu).

SOPAC opened the meeting introducing the current status of the energy programmes in the region. Points highlighted were:

- Regional Energy Meeting held in July 2002, Cook Islands endorsed two important papers:
  - Pacific Type II Energy Initiative
  - Pacific Energy Policy Paper
- Existing Regional Energy Programmes

#### *Energy Efficiency and Conservation*

The work on benchmarking for energy consumption in commercial building carried out by SOPAC was acknowledged by the EWG and recommended that the benchmarking work be further strengthened by collaborating with other partners and sharing information.

The EWG acknowledged the work on energy efficiency and conservation being carried out by industry partners in Pacific Island countries. One particular company, Integrated Energy Services shared its experiences with the EWG and highlighted the many energy savings opportunities especially in the tourist industry where savings as high as 50% could be realized with 1-3 year payback.

Recognising the importance of energy efficiency and conservation in the region the EWG recommended the following:

- SOPAC treat as a priority the work on benchmarking of energy consumption for commercial buildings.
- SOPAC to develop partnerships with other government agencies and industry partners and to share energy conservation data which could link in as part of the energy supply and demand database.
- SOPAC to establish best practice energy consumption standards for tropical climate, taking into account the cost of energy within the Pacific island countries.
- SOPAC to disseminate widely the findings from benchmarking activities and that the information on potential energy and financial savings reach higher authorities within the Pacific island countries.
- SOPAC to highlight the economic and environmental aspects of energy consumption to identify the potential for energy reductions in Pacific Island economies.

The EWG recognises the importance of energy efficiency and conservation in the small island economies and recommends that SOPAC develop an education programme targeting the general public.

The EWG recognizes the volume of waste plastics in Pacific Island nations and recommends that related technologies used in developed countries for recycling waste plastic be researched and considered for adoption as appropriate.

The EWG acknowledges the problems related to the disposal of waste oil in Pacific island countries and noted that one way of addressing the problem is to regulate its removal by the oil companies.

The EWG noted the decision reached at the recent Regional Energy Meeting in Rarotonga in July 2002 that the focus of energy efficiency be prioritized in the transport sector. It further noted that although the transport sector is one of the highest consumers of imported fuel, it is anticipated that energy saving in this sector may be more difficult to achieve.

The EWG noted the interest of industry players in developing wave energy technology in the Pacific. Particularly the interest shown by the US Wave Energy and the Ukarine SEA Electrical Generators to install demonstration projects in selected countries in the region and develop a formal relationship with SOPAC.

SOPAC briefed the EWG on status of the energy policy, the geothermal deep drilling funding proposal and confirmed that it continues to provide assistance to member countries with their energy demand and supply database and national energy policy statements.

#### IV. Coastal Working Group Report

##### *Attendees*

Gary McMurtry	- Chair
Robert Smith	- Rapporteur
Keith Cook	- HURL
Dave Tappin	- BGS
David Garton	- Georgia Institute of Technology
Peter Harris	- Australian Geological Survey Organisation
Bill Erb	- IOC Perth Regional Programme Office
Stephen Eagar	- Victoria University, NZ

Vili Baleivanualala	- Mineral Resources Department, Fiji
Luna Wong	- Mineral Resources Department, Fiji
Loren Kroenke	- UH, SOEST, HIGP
Chuck Fisher	- Penn State University
Seong-Pil Kim	- KIGAM

The working group reviewed the recommendations of the 2001 working group and discussed the relevance of the papers presented during STAR 2002.

Robert Smith updated the coastal working group on the various projects SOPAC worked on throughout the year. These range from investigation for sand and gravel resources, infrastructure development in the coastal zone, water quality monitoring and the use of GIS and remote sensing in the analysis of historical coastline change in the Marshall Islands, Cook Islands, Samoa, and the states of Yap and Chuuk in FSM. The benefits of multibeam mapping relating geological setting and habitats were also discussed noting the benefits this technology can bring to resource evaluation in SIDS.

Sand and gravel supply used in the islands for infrastructure development continues to be important. The working group noted the difficulty of accessing lagoon and offshore resources, using appropriate technology. SOPAC informed the working group of the significant progress that has been made with Kiribati to acquire a dredge to mine lagoon sand and gravel resources identified through previous survey work done there by SOPAC.

SOPAC informed the working group that funding has been secured to implement a real time coastal water quality monitoring buoy in Manihiki lagoon. Sensors to be included are a meteorological suite, conductivity, temperature, dissolved oxygen, chlorophyll and pH. Due to budget limitations, ammonia and nitrate sensors are to be included at a later date. Communication with the buoy is being investigated, including the use of Argos or the IRIDIUM system.

The working group recommended:

- That SOPAC continues with the work necessary to find alternate marine aggregate resources using the best technology available to SOPAC, as presented in STAR.
- The Manihiki lagoon Pearl farming project be designated a pilot project under Coastal

GOOS. The rationale is that the project is intended to be continuous, producing a long-term data set and providing a useful product to the industry.

- It was brought to the attention of the working group that the Coastal GOOS Strategic Plan has been finished. It was recommended that SOPAC should explore the possibility of a seminar or workshop to present a synthesis of the strategy to the region. This should be a joint undertaking of SOPAC and the IOC to be targeted on or before the next meeting of STAR.
- The working group was informed of the third Geohab meeting focussing on using geological mapping of the seabed with multibeam technology for habitat classification. It was recommended that a representative from SOPAC attend the 3<sup>rd</sup> meeting being held in Hobart in 2003.
- The working group noted that coastal erosion is still a serious issue in the coastal states and the use of high resolution satellite mapping with historical aerial photography to assess coastal change by SOPAC in Tonga and Fiji were excellent examples of how SOPAC has built up a working expertise in this area.
- The working group discussed the environmental assessment recommendation in the 2001 STAR report and proposed an amendment. It recommended that both Pacific

SIDS and aid donor organisations/nations adopt as policy the standard operating practice of requiring a professional EIS for any development to be undertaken in the coastal zone and that SOPAC serve as technical reviewers of such EIS. In addition, SOPAC may consider tapping expertise of advisors in cooperating countries.

- Coastal zone studies and assessments should incorporate data collected from rocky shoreline sectors, which are usually by-passed in favour of beaches and estuaries.

Rocky shorelines contain archives of extreme events such as cobbles and boulders, gravel deposits and isolated larger blocks (50-100 tonnes) of small clusters of blocks and placed by category 5 cyclones and tsunamis. Many of these deposits can be dated using concentrations of bomb <sup>14</sup>C spanning the past 50 years or various cosmogenic isotopes for older sites. These can provide a history of the incidents and magnitude of large wave events that have had major impacts on the coastal zones of SIDS. The record of such events in beaches is commonly cryptic because erosion predominates. Their record in estuaries can be quite equivocal because finer sediments predominate. There may be no depositional record. Records may be modified by processes generated in the hinterland such as large floods, or the records may underestimate the magnitudes of the events of interest.