



**SOUTH PACIFIC
APPLIED GEOSCIENCE COMMISSION**

Annual Report 1990

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FOREWORD



Jioji Kotobalavu, Director

The year 1990 was an important watershed in the evolution and development of SOPAC.

The member countries adopted a new Constitution firmly establishing SOPAC as an independent, inter-governmental, regional organisation, and giving it the same international legal standing as other regional organisations in the South Pacific such as the Forum Secretariat, the South Pacific Commission, and the Forum Fisheries Agency.

SOPAC has also established a special reporting relationship with the South Pacific Forum and is a member of the South Pacific Organisations Coordinating Committee (SPOCC).

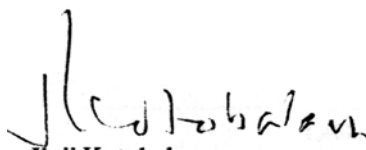
In accordance with decisions taken by the Member Countries at their Annual Session in Canberra in October 1989, the SOPAC Budget format and accounting system have been revamped and updated. Further, as accepted by the Governing Council at the SOPAC Annual Session held in Tarawa in October 1990, terms and conditions of staff employment in the Technical Secretariat have been rationalised for application from 1 January 1991.

In its implementation of the SOPAC Technical Work Programme, the Technical Secretariat has continued to give priority focus to those programme activities of direct interest and relevance to the development needs and concerns of the SOPAC island member countries.

An in-depth review and evaluation of each segment of the Technical Work Programme will be started in 1991. This is to ensure that the scope and direction of the SOPAC Work Programme activities, both in the short-term and the long-term, directly reflect the needs and priorities of the member countries.

The Technical Secretariat has maintained close and constant contact with all member countries and with supporting Governments, organisations and agencies.

The Technical Secretariat is deeply grateful for the excellent support and cooperation it has received from everyone.


Jioji Kotobalavu
Director

INTRODUCTION TO SOPAC

The South Pacific Applied Geoscience Commission (SOPAC) is an inter-governmental, regional organisation established by the member countries to:

- provide information on the physical environment of coastal and nearshore areas to assist with resource and environmental management, hazard evaluation and coastal protection works, and planning and implementation of coastal development projects.
- investigate the resource potential of coastal, nearshore and offshore minerals including construction materials, phosphates, cobalt-rich crusts, manganese nodules, polymetallic sulphides, precious corals, and detrital minerals such as gold.
- assess and promote the hydrocarbon and wave energy potential of the region;
- coordinate marine geological and geophysical research being carried out in the region;
- curate and distribute marine geological and geophysical data from the South Pacific;
- train nationals in the implementation and management of their work programmes.

MEMBER COUNTRIES

Member countries are currently Australia, Cook Islands, Federated States of Micronesia, Fiji, Guam, Kiribati, Marshall Islands, New Zealand, Papua New Guinea, Solomon Islands, Tonga, Tuvalu, Vanuatu, and Western Samoa.

BACKGROUND

SOPAC was established in 1972 as CCOP/SOPAC (the Committee for Coordination of Joint Prospecting for Mineral Resources in South Pacific Offshore Areas) under the sponsorship of the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP). In 1984, CCOP/SOPAC changed its legal status to become an independent, regional, intergovernmental body. At their Annual Session in Tarawa, Kiribati, in October 1990, the member countries adopted an Inter-governmental Agreement, which they agreed to refer to as the Tarawa Agreement, as SOPAC's new Constitution.

In deciding at its meeting in Canberra in October 1989 that a new Constitution should be adopted for SOPAC, the Governing Council also decided to adopt the new name South Pacific Applied Geoscience Commission, whilst retaining the acronym SOPAC. The change of name is to emphasise its role as an independent and South Pacific entity and to reflect its Work Programme activities.

The Commission comprises the Governing Council, composed of representatives of the member countries, the Technical Secretariat and the Technical Advisory Group (TAG). The Commission meets annually to review work completed, and to discuss and plan future work required by member countries.

During the Annual Session, the Commission draws up its Work Programme, consisting of Country Projects and Regional Projects. Country Projects define applied work requested by individual members to assist with their countries' development. Regional Projects have more general objectives, either to provide the background information needed for applied work or to synthesise results for widespread use.

The Commission's Work Programme is carried out by its Technical Secretariat (Techsec) in close liaison and consultation with the member countries. Techsec is based in Suva, Fiji and currently has a staff of about 50 of which half are professionals. A staff list is given in Appendix 1.

SOPAC ANNUAL SESSION

The SOPAC Annual Session is a meeting of the Commission, and has three components:

- a Plenary Session, which covers the procedural aspects of the meeting and the presentation of reports from member countries, donor Governments and organisations, and Techsec. This session is a meeting of the Council at which other delegates are invited as observers, contributing to the discussion of non-technical matters concerning SOPAC such as cooperation, management and funding.
- a meeting of the Technical Advisory Group (TAG). TAG comprises advisors attending the Annual Session who are nominated by member countries and by supporting Governments and organisations, or are invited by Techsec. The TAG meeting is a technical session to review and make recommendations on the SOPAC Technical Work Programme.
- a Budget and Policy Session held by the Council. Attendance is restricted to representatives of member countries and selected observers. It is at this Session that policy on all SOPAC matters, including the SOPAC Work Programme and Budget is decided.

Annual Sessions of SOPAC over the past five years have been as follows:

15th Session, Rarotonga, Cook Islands,
5-13 September 1986

16th Session, Lae, Papua New Guinea,
12-21 October 1987

17th Session, Suva, Fiji,
13-22 October 1988

18th Session, Canberra, Australia,
2-13 October 1989

19th Session, Tarawa, Kiribati,
1-11 October 1990



Kiribati weaving on the conference satchels for the 19th Annual Session.

MANAGEMENT OVERVIEW

NEW CONSTITUTION

SOPAC became an inter-governmental regional organisation in 1984 when the member countries signed a Memorandum of Understanding. However, it was understood at the time that a more appropriate legal instrument would be considered.

Subsequently, at its Annual Session in Tarawa in October, 1990, the Governing Council adopted for signature a new Constitution, known as the Tarawa Agreement, establishing the South Pacific Applied Geoscience Commission.

The Governments of the Cook Islands, Guam, Kiribati, Solomon Islands and Western Samoa signed the Agreement in Tarawa on 10 October, 1990. This was followed by signature in Suva by the Governments of the Marshall Islands on 19 October, 1990, the Federated States of Micronesia and Fiji on 24 October, 1990, New Zealand on 7 November 1990, Tuvalu and Australia on 4 January, 1991, and Vanuatu on 16 January 1991. The new Constitution is under consideration by the other member Governments for their signature.

In accordance with its provisions, the Constitution came into force on 18 November, 1990.

PERMANENT LOCATION FOR TECHNICAL SECRETARIAT

At its meeting in Tarawa in October 1990, the Governing Council also decided that the SOPAC Technical Secretariat should continue to be based in Fiji. This followed direct consultations and agreement amongst those countries that had offered to be permanent host to the Technical Secretariat.

CONSULTATION WITH MEMBER COUNTRIES

In the formulation, implementation and review of the SOPAC Work Programme and its overall operations, the Technical Secretariat has kept in close touch with the member countries.



*SOPAC Technical
Secretariat, Suva, Fiji.*

CONSULTATION WITH SUPPORTING GOVERNMENTS AND INTERNATIONAL AGENCIES

Given the importance to SOPAC of the substantial grant and in-kind assistance that it regularly receives from supporting Governments and international agencies, the Technical Secretariat has also maintained close and regular contacts with donor sources, including visits to a number of them.

Regular in-house briefings have been held at the Technical Secretariat for locally-resident representatives of Australia, New Zealand, Fiji, Canada, EC and UNDP to keep them fully informed on the application of their grant assistance or in-kind support to SOPAC in the implementation of the Work Programme.

During late November and early December 1989, the Director and Deputy Director travelled to the United States, Europe and Japan for talks with donor Governments and organisations.

On the basis of discussions in Norway, the Norwegian Government decided to continue its support for the SOPAC wave measurement programme until 1991. Discussions with European Commission representatives in Brussels were to secure early approval of specific expenditure proposals within the ECU 5 million already approved for SOPAC under Lome Convention III. There were also general consultations on the prospects for continuing EC assistance to SOPAC through the New Lome Convention IV.

A visit to Paris to seek a general commitment of continuing assistance to SOPAC from the French Government, from ORSTOM, and from IFREMER, re-affirmed France's desire to continue its support. Visits were also made to the Commonwealth Fund for Technical Cooperation in London and to the British Geological Survey for discussions on the continuation of their technical and training assistance support to SOPAC. The Deputy Director also travelled to Hanover, Germany, for discussions with Dr U. von Stackelberg and others on the RV *Sonne* cruise programme in the South Pacific for SOPAC member countries.



The German RV Sonne which has carried out extensive offshore work in the SOPAC region.

The Director had discussions with senior UNDP officials in New York on current UNDP assistance to SOPAC and funding under the new UNDP five-year cycle from 1992. Meetings were also held with officials in the UN Centre for Transnational Corporations and with the UN Under-Secretary General for the Law of the Sea.

The Deputy Director met with senior staff at the Hawaii Institute of Geophysics to review on-going cooperation between HIG and SOPAC, whilst the Director had meetings in Tokyo with the Director-General of the Metal Mining Agency of Japan and with the Head of the Pacific Division of the Japanese Ministry of Foreign Affairs on continuing assistance by Japan to SOPAC, including an extension of its offshore minerals investigations programme for SOPAC member countries. The Director also took the opportunity to meet officials of the Sasakawa Pacific Island Nations Fund in Tokyo to explore funding assistance to SOPAC.

To further prepare the groundwork for continuing UNDP/ESCAP assistance to SOPAC, the Director and Deputy Director visited Bangkok in May-June, 1990. Apart from attending the Annual ESCAP Conference, discussions were held with senior officials from the Technical Assistance, Mineral Resources and Energy Resources Divisions of the ESCAP Secretariat. It was agreed that a UN mission should review the effectiveness of current ESCAP/UNDP support to SOPAC and evaluate future assistance in the new UNDP five-year cycle beginning in 1992. It was also agreed that an ESCAP official would visit the Technical Secretariat each year before the SOPAC Annual Session to consult on SOPAC work programme activities to be supported by ESCAP.

Through SOPAC's membership of the South Pacific Organisations Coordinating Committee (SPOCC), the Director took part in direct consultations with senior officials of the UNDP in Noumea in October and in Honolulu in December on assistance to regional programmes in the South Pacific, including SOPAC, in the new UNDP five-year programme cycle.



Study of coastal processes in Muri Lagoon, Rarotonga, Cook Islands.

COOPERATION WITH OTHER SOUTH PACIFIC REGIONAL ORGANISATIONS AND PROGRAMMES

SOPAC has also given high priority to establishing close working relationships with other South Pacific regional agencies. The Director of the SOPAC Technical Secretariat was Chairman of the South Pacific Organisations Coordinating Committee (SPOCC) for 1990. Through the SPOCC network, SOPAC is closely coordinating its activities with other regional organisations including the South Pacific Forum, the South Pacific Commission, the Forum Fisheries Agency, the University of the South Pacific, and the Pacific Islands Development Programme.

In specific work programme activities, SOPAC has coordinated its Coastal and Nearshore Programme activities with the University of the South Pacific's Institute of

Marine Resources, the Atoll Research Centre, and Institute of Research, Extension and Training in Agriculture. SOPAC has consulted regularly on Coastal and Nearshore Programme activities with the South Pacific Regional Environmental Programme. Under its Hydrocarbon Programme, SOPAC has kept in touch with the Energy Division of the Forum Secretariat. Regular information exchange and joint review of economic potential of deep-sea mineral resources have been established with the Resource Systems Institute of the East-West Center under the Pacific Islands Development Programme.

SOPAC has conducted a number of its training courses jointly with the Institute of Marine Resources at USP. SOPAC has also assisted with teaching under the Forum Fisheries Agency Ocean Resources Management Programme at USP. The SOPAC library is a member of the Pacific Islands Marine Resources Information System (PIMRIS) of the USP library, contributing bibliographic data on non-living marine resources.

WORK PROGRAMME EVALUATION

At its 19th Annual Session in Tarawa in October, 1990, the Governing Council decided that, beginning in early 1991, a series of in-depth evaluations should be undertaken of the different key components of the SOPAC Work Programme. The main purpose will be to ensure that SOPAC activities fully reflect the development needs and priorities of the island member countries, and also that the best possible approach is being followed in programme implementation to achieve maximum cost efficiency and effective programme delivery.

Such reviews will clearly be of mutual benefit both to the member countries and to supporting Governments and international agencies, given their mutual interest in satisfying themselves that resources made available through SOPAC are being put to good use in responding to the expressed development needs and aspirations of SOPAC island member countries.

The first review will be of the Training Programme in 1991. Evaluation of the SOPAC Offshore Programme and the Coastal and Nearshore Programme will follow as separate reviews.



The RV Tovuto carrying out a seabed survey of the Yasawa Group, Fiji.

FINANCE

BUDGET

The annual budget of SOPAC is reviewed and set by the Governing Council at its Annual Session. At its Eighteenth Annual Session in Canberra in October 1989, the Governing Council had approved a total Budget of F\$9,652,716 for 1990. This was to be covered as follows :

Contributions	Members	Donors	Total
Cash	F\$107,250	F\$4,908,116	F\$5,015,366
In-kind	F\$175,000	F\$4,462,350	F\$4,637,350
Total	F\$282,250	F\$9,370,466	F\$9,652,716

At its Nineteenth Annual Session in Tarawa in October 1990, the Governing Council approved a total Budget of F\$8,707,588 for 1991. This is to be covered as follows :

Contributions	Members	Donors	Total
Cash	F\$143,000	F\$3,766,210	F\$3,909,210
In-kind	F\$158,000	F\$4,640,378	F\$4,798,378
Total	F\$301,000	F\$8,406,588	F\$8,707,588

Details of the 1990 Budget are given in Appendix 2. Also at its meeting in Tarawa in October 1990, the Governing Council adopted the Financial Statements for the year ending 31 December 1989. These are presented in Appendix 3.

MEMBERSHIP CONTRIBUTION

This was set at F\$9,750 for each member country for the 1990 Budget and at F\$11,000 for the 1991 Budget. It was agreed that Kiribati and Tuvalu should continue to contribute 75% and 25% respectively of the agreed assessed contribution.

The Technical Secretariat is grateful to the member countries for making every endeavour to ensure early payment of their assessed membership contribution.

DONOR SUPPORT

SOPAC continues to be heavily dependent on voluntary assistance, both in cash and in-kind, from member Governments and international agencies, which has continued to be very generous.

Australia, New Zealand and Fiji have, each year, provided a special grant to SOPAC in addition to their membership contribution. Australia's extra-membership contribution to SOPAC in 1990 totalled F\$451,594, comprising F\$385,540 in additional regular contribution, F\$44,065 under its Regional Organisations Small Grants Scheme, and F\$21,989 through its support under the Tripartite Programme (with New Zealand and the United States). New Zealand's additional grant to SOPAC in 1990 totalled F\$360,280. Under its commitment of annual grant assistance to SOPAC, Fiji gave F\$163,119 for 1990.

This generous annual grant assistance by Australia, New Zealand and Fiji, over and above their membership contribution, has been very helpful in filling budget gaps arising from delays in the payment of pledged contributions or from decisions of particular donor sources to tie their support to SOPAC to certain specified programme activities.

Canada has continued to be responsive to requests from SOPAC for work programme assistance, which is provided under several programmes, mainly through the International Centre for Ocean Development (ICOD) and the Canadian International Development Agency (CIDA). ICOD commitments to SOPAC over the past three and a half years total over CAD\$3 million, and include support of the Nearshore and Coastal Programme, the Training Programme and the SOPAC component of the Pacific Islands Marine Information Services System (PIMRIS). This level of support is expected to be continued. Approved CIDA-funded projects, including support for the Hydrocarbon, Training and Offshore Programmes, provide over CAD\$1.5 million over a two and a half year period. Petro-Canada International Assistance Corporation (PCIAC) provided technical and other

assistance worth CAD\$950,000 to the SOPAC Hydrocarbon Programme during 1987-89.

Assistance to SOPAC from the European Community countries is being provided within the allocation of 5 million ECU (about F\$8 million) which has been approved for SOPAC under Lome Convention III. However, actual payments into the SOPAC Budget from this source have been considerably delayed by complicated and protracted EC procedures and requirements.

France is continuing its technical and grant assistance to SOPAC. For 1990, grants of FF619,000 (F\$170,097) have been received from the Government of France and FF100,000 (F\$27,479) from IFREMER. Consultations are continuing with ORSTOM on a mutually agreed framework within which ORSTOM will be able to provide regular technical assistance to SOPAC.

Norway provides assistance to SOPAC's wave measurement programme through a grant totalling Nok 8.7 million (F\$1.8 million) for the period 1989-91. Norway is willing to consider a new programme of assistance to SOPAC at the end of its current commitment in 1991, and programme proposals were submitted in December.

The Government of Japan's assistance to SOPAC is continuing in the form of a technical expert assigned to the Technical Secretariat, together with support for SOPAC's offshore minerals investigations. An agreement for Japan to carry out further deep-sea minerals surveys for SOPAC member countries during the period 1990-1994 was signed with the Cook Islands, Kiribati, PNG, Solomon Islands and Vanuatu. Japan also signed a similar agreement of support with Fiji.

A private funding source in Japan, the Sasakawa Pacific Islands Nations Fund established by the Sasakawa Peace Foundation, has agreed to give SOPAC F\$43,000 in programme grant support. SOPAC is the first recipient of assistance from this Fund.

The United States has maintained a modest level of programme support to SOPAC. Apart from a technical expert provided by the US Geological Survey, USAID has also been

helping to fund SOPAC's annual Coastal Mapping Workshop.

Germany has continued to provide programme support to SOPAC through deep-sea mineral resource surveys and training on the RV *Sonne*.

The Commonwealth Fund for Technical Cooperation (CFTC) and the United Nations through UNDP, ESCAP, and the UN Centre for Transnational Corporations have been the main source of multilateral assistance to SOPAC. CFTC have extended the funding of a Petroleum Geologist and a Marine Geologist at the Technical Secretariat, and are now the main source of funding support for SOPAC's annual Earth Science and Marine Geology Course. Its current commitment of financial support for this training programme include F\$56,758 in 1990, F\$63,569 in 1991 and F\$71,197 in 1992. Together with Australia, CFTC has also agreed to take part in an independent evaluation of SOPAC's Training Programme, to be undertaken in early 1991.

UNDP/ESCAP technical and other assistance to SOPAC has continued within the framework of the approved total commitment of US\$2,849,500 for the five-year cycle 1987-1991. The Technical Secretariat has started consultations with both ESCAP and UNDP to seek continued assistance to SOPAC in the new UNDP five-year programming cycle from 1992. A critical input into this process will be the UN evaluation of its current support to SOPAC to be undertaken in early 1991.

The New York-based UN Centre for Transnational Corporations is a new UN source of support that the Technical Secretariat has fully utilised this year. The Centre has been particularly helpful in undertaking a review of petroleum legislation in the Solomon Islands and Vanuatu, and in assisting with the drafting of new mining regulations in the Solomon Islands.

All these contributions from donor sources have been enormously helpful to SOPAC in the implementation of its Technical Work Programme.

WORK PROGRAMME SUMMARY FOR 1990

The SOPAC Work Programme reflects work required of the organisation by its member governments, and consists of three main areas of technical work: the Coastal and Nearshore, Hydrocarbon, and Offshore Programmes. These are supported by strong Training and Technical Support Programmes. During the last 12 months, the activities of Techsec have reflected the changing emphasis in the needs of the member countries.



Lowering a geophysical towfish during a survey to map seabed morphology in Fiji waters.

The greatest need for assistance from SOPAC is now clearly in the Coastal and Nearshore Programme. There is a lot of development activity proposed, planned, and in progress in member countries' coastal areas. Much of SOPAC Techsec's resources for this programme are now being allocated to provide information and advice to assist with a variety of engineering projects in coastal areas, with the definition and management of nearshore sand and gravel resources, and with management of coastal erosion. As well as an expansion of geological and geophysical studies, there has also been a substantial increase in the amount of physical oceanographic work now being done. Studies of weather, waves, and currents as related to sediment movement and coastal erosion, and mapping of the physical environment, are being done to improve the quality and extent of the advice given to members to assist with management of the coastal environment. Development of a substantial regional database on wave energy is progressing well with data collection in one country nearing an end, continuing in three others, and plans to start data collection in at least two other countries. An ambitious programme of detailed mapping of selected coastal and nearshore areas has many maps in preparation, some of which are ready or nearly ready for publication. To assist with this work, an airphoto library is being established at Techsec. With the expansion during the last 12 months from four to seven professional positions serving this programme, Techsec will be able to effectively respond to the increasing requests from its members for assistance in this area.

For those countries with potential for the discovery of hydrocarbons, the Hydrocarbon Programme continues to be a priority area for work by Techsec. With the completion of major reviews of hydrocarbon potential in Fiji and Tonga, and publication of glossy promotional brochures on the hydrocarbon potential of Solomon Islands and Tonga offshore areas, this programme has reached a stage of maturity. Promotional work begun during the last 12 months will continue and as new data becomes available, especially in Fiji, Solomon Islands, and Vanuatu, reassessment work

will continue. Assistance and advice in other areas will also continue such as developing the legal framework for exploration and drilling, and specialist technical advice during negotiations with interested companies. Techsec staffing will remain at the current level of two professionals.



Study of erosion of Ranadi Beach, Guadalcanal, Solomon Islands includes assessment of the effects of sand and gravel extraction.

All member countries have vast offshore areas within their Exclusive Economic Zones (EEZs). The Offshore Programme is dedicated to assisting members build up sufficient information on EEZ resources and the nature of the environment in which they occur so that long-term development plans and objectives may take these into account. Seabed mapping remains a priority work requirement and a major SOPAC mapping exercise will be setup during the next 12 months to follow on from the GLORIA work which is approaching completion. Emphasis will also be placed on updating the manganese nodule and cobalt-rich crust data bases, and the publication of summaries on the distribution of deep-sea mineral resources. A large part of the work under this programme is the coordination of geological and geophysical cruises conducted by visiting research vessels. This work will continue as required. Due to increased activity by others in the region in recent years, Techsec professional staffing has been increased from one to two.

The Training Programme has expanded during the last 12 months to meet the training requirements of member countries. The variety of different training activities which SOPAC continues to provide include formal certificate courses and scholarships for first degree training, on-board-ship training, fellowships to work at Techsec and in the field with Techsec staff, training at institutions other than Techsec, attendance at workshops and seminars, and assistance through other training programmes. Management training is a new component introduced to the programme during the last 12 months. The emphasis of all training will continue to be within-the-region activities covering all aspects of the SOPAC Work Programme. Professional staffing will increase from one to two when the position of Assistant Training Coordinator is filled.

To assist implementation of the work programme, a Technical Support Programme has been developed at Techsec. Three Data Management staff maintain databases so that members can keep track of what data exists and where it can be found, and store data collected by Techsec and copies of other data lodged with Techsec. Digital data storage and processing capabilities are being developed. Technical Information provides drafting, publication, and library services with a staff of six. As well as maintaining drafting support for reports and displays, good progress has been made with the compilation and preparation of a variety of maps which eventually will be published. The production and distribution of reports continues as required with the desktop publishing system fully operational. During the last year, emphasis has been placed on producing a range of publicity material including a "what is SOPAC" pamphlet, a circular summarising the results of technical work, and a new-look newsletter.

Library development has reached the stage where the Techsec collection of books, serials, and maps and charts has been reorganised and classified, and a non-living resources bibliographic database established. The Assistant Librarian has successfully completed her Masters degree and with her return to Techsec, the Librarian will be able to provide more direct assistance to members in-country, an activity started during the last year. The Technical Services group are continuing to provide assistance with equipment purchase, operation, maintenance, and repair. With field activities increasing in number, two new technicians will soon be added to the present workshop staff of five. Maintenance and operation of PC's, involving both hardware and software, is now a major part of the work of workshop staff.

The overall aim of Techsec management is to ensure that wherever possible, priority is given to the allocation of resources required to implement the SOPAC Work Plan established through discussion and consultation at the Annual Session and according to priorities set by member government representatives. The efficient and effective implementation of the SOPAC Work Programme will continue to be Techsec's primary function, with the emphasis and direction changing as needed to meet

member governments' requirements. Contact is being maintained with other institutions and organisations such as USP and SPREP to ensure that work which overlaps will be carried out in the most efficient way and to the countries advantage. Techsec is also working closely with other activities which are related to the SOPAC Work Programme and these include the AIDAB-funded FORUM climate change and sealevel rise programme, and AIDAB- and USAID-funded programmes related to development monitoring and resource management in Tarawa Lagoon and other lagoons in the Gilbert Islands group of Kiribati.

Each of the SOPAC field and support programmes is outlined in the following sections with some examples of the work carried out in member countries in 1990. More details on Work Programme activities are given in SOPAC Miscellaneous Report 99 "Report on the Work Programme of the SOPAC Technical Secretariat".

Shoreline damage at the Fijian resort caused by Cyclone Sina in November 1990. The shoreline prior to the cyclone is marked by the line of boulders at centre left.



COASTAL AND NEARSHORE PROGRAMME

The majority of SOPAC's field studies are now in this programme, which provides information on the physical aspects of coastal and nearshore areas to assist with resource and environmental management. The work includes investigations of nearshore mineral resources; evaluation of the causes of and solutions for coastal erosion; and mapping the marine geological processes responsible for the morphology of coastlines. An important application of the work is to provide data against which any future changes can be measured, so that the coastlines of member countries can be conserved, utilised or developed wisely.

The programme addresses the problems associated with engineering projects in the coastal zone, and geologic hazards related to coastal erosion and protection. Published maps of coastal and nearshore areas are an important result of the work. Member country personnel are trained in mapping coastal environments so that the countries will be less dependent on outside expertise in the future.

The programme is divided into four sub-programmmes: Nearshore Minerals; Coastal Development; Coastal and Nearshore Mapping; and Ocean Energy. Each has a defined set of objectives, but the study methods, information gained, and applications are closely interwoven.

NEARSHORE MINERALS

The broad objectives of nearshore minerals investigations are to locate nearshore mineral prospects that are economically viable for either local or export markets and to promote those prospects to industry. The main activities are resource evaluations of construction materials, detrital minerals, insular phosphates and precious corals. Reconnaissance geological and geophysical surveys are first conducted to evaluate resource potential, followed by detailed surveys to define economic potential. Finally, findings are reported to member country governments with recommendations for further work.

Nearshore minerals work in 1990 was mainly on construction materials, reflecting the importance of sand resources to island member countries and the potential impact that their extraction has on coastal environments. A detailed bathymetric survey was carried out over an area west of Nukubuco Islet, Fiji, which has been a dredging site for carbonate sands for more than 15 years. The survey is part of ongoing work to establish an inventory of sand resources remaining in nearshore waters near Suva.

A geophysical survey and drilling programme near Fafa Island, Tonga, identified two basins with sand resources suitable for construction purposes. The largest of these may contain over two million tonnes of sand, and has the potential to relieve pressure on beach sands as an aggregate source.



The effects of sand mining at Mele Bay, Vanuatu, are shown by the narrowness and steepness of the beach, which has left the coastline particularly susceptible to cyclone damage.

COASTAL DEVELOPMENT

The interaction of natural coastal processes with the effects of coastal development are of great importance to island member countries. Coastal development studies were a key aspect of SOPAC's Work Programme in 1990.

The objectives of this work are to assess geological and oceanographic hazards to the coastal and nearshore environment and to evaluate the extent and severity of coastal erosion taking place at particular sites in member countries. The results of this work, and of coastal mapping work, are applied to engineering projects so that they may be designed to minimise any adverse effects on the coastal zone. The training of member country nationals in hazard evaluation and erosion surveying techniques is an important aspect of the work which includes the Coastal Engineering Workshop and the participation of member country nationals during SOPAC coastal and nearshore surveys.

A study of Ngatangia Harbour - Muri Lagoon on Rarotonga, Cook Islands, was carried out to establish the water circulation and flushing action of the lagoon-harbour system. A separate survey, gaining information on water depth, sediment type and coastal processes, was conducted to determine the feasibility of dredging for a harbour development.

Fiji requested a special study to estimate storm surge for major ports where there will be further onshore development. A comprehensive study of Suva Harbour that included cyclone analysis was reported to the Fiji Port Authority so they can develop building design criteria for the harbour area.

A detailed study was begun on the effects of sand and gravel extraction at Ranadi Beach near Honiara on Guadalcanal, Solomon Islands. The objective of the study is to assess the coastal erosion along the beach in terms of morphology changes, beach mining, and the natural recovery rate of the beach. The field work included the acquisition of existing beach profile data, establishment of a new beach profile monitoring system, and an assessment of historical shoreline changes from the analysis of aerial photographs and survey maps. The relative effects of gravel extraction will be

determined and recommendations made on the regulation of beach mining. Two further studies were initiated to determine the causes and rates of coastal erosion at Gizo and on the islands of Kwai and Ngongosila.

In Kiribati, beach profile surveying continued, monitoring long-term coastal erosion and accretion patterns in South Tarawa.

In Tuvalu, a preliminary survey of the coastal area of a proposed slipway for the Fisheries Department was carried out to determine whether it would interfere with present coastal processes and cause erosion or deposition in the area of the main shipping wharf. Recommendations were made on the construction of the slipway.

Additional work was carried out on a hydraulic and water quality study of Vila Harbour and Erakor Lagoons, Vanuatu, that had been initiated in 1983. The project was completed this year and recommendations made to the Government. Another study was initiated on the causes of coastal erosion at Mele Bay on the island of Efate.

After Cyclone Ofa in February 1990, the Government of Western Samoa requested a review of a construction site for the proposed Central Bank Building to be located on filled land adjacent to Apia Harbour. This evaluation required estimation of the probability and recurrence of tropical cyclones that would impact Western Samoa. The Waverider buoy survived Cyclone Ofa and recorded critical wave data throughout the cyclone. This data was of considerable value for the Apia building site evaluation. Another study of the effects of Cyclone Ofa on the coast of Upolu documented physical damage and coastal changes.



Setting up a current meter in Muri Lagoon, Cook Islands.

COASTAL AND NEARSHORE MAPPING

The objectives of coastal and nearshore mapping are to conduct geological, bathymetric, and morphological surveys of the member countries and to use the data from the surveys to produce maps of the coastal and nearshore zones that are required for planning coastal development, hazards protection, and mineral exploration. There is extensive interaction and overlap with other components of the Coastal and Nearshore Programme. Training of member country nationals in mapping techniques includes the Bathymetric Mapping Course, the annual Coastal Mapping Workshop, interpretation of the data collected during workshops and field studies, and participation of member country nationals during SOPAC project surveys.

Several maps are in various stages of preparation, including bathymetric maps of Pukapuka and Rakahanga lagoons and offshore Aitutaki in the Cook Islands; bathymetric maps of Nukulaelae, Nukufetau and Funafuti lagoons in Tuvalu; coastal morphology maps of Upolu, Western Samoa; and bathymetric maps of Apolima Strait and of the EEZ of Western Samoa.

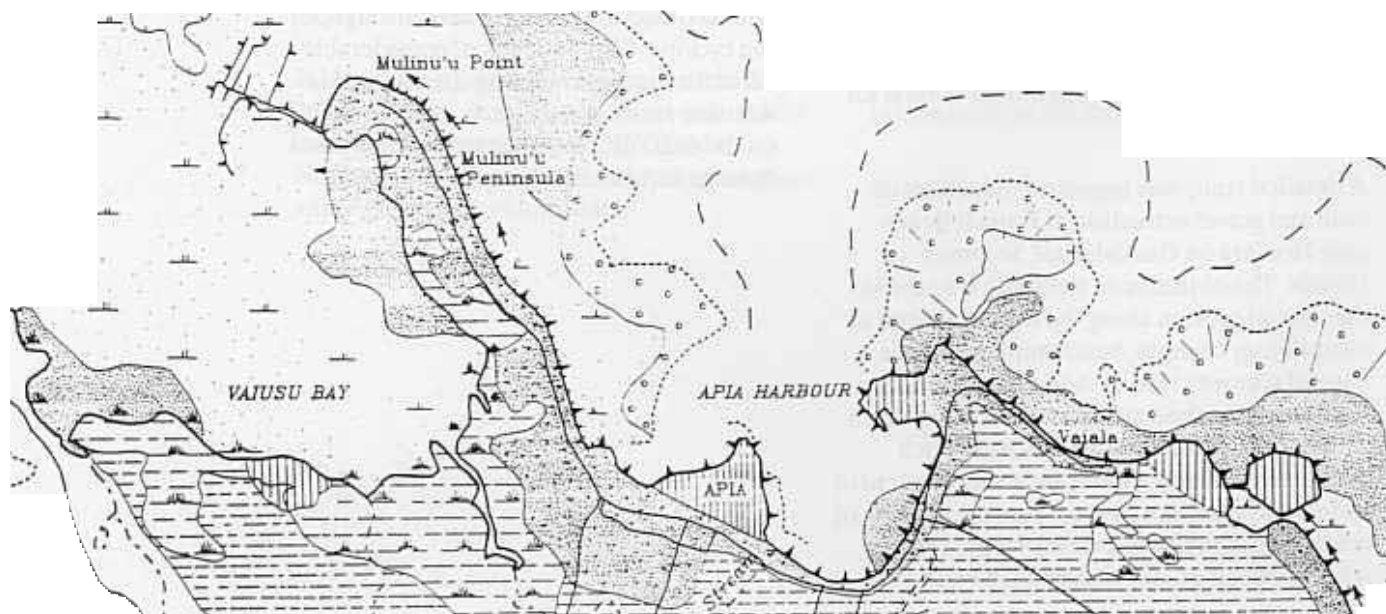
The Technical Secretariat is assembling a library of aerial photographs of critical coastal areas of member countries to assist coastal mapping and coastal development studies.

OCEAN ENERGY

The evaluation of the potential for deriving electrical power from wave energy requires the collection of extensive oceanographic data. A NORAD-funded programme is currently collecting wave data in five countries: Cook Islands, Tonga, Western Samoa, Tuvalu and Vanuatu. Data on the wave climate of each site are collected by a waverider buoy, which may be moored in water depths of up to 1000 m, and relayed by satellite for processing and analysis. To cover seasonal and yearly variations, 3-5 years of measurements are needed at each site. In Tonga and Cook Islands, measurements started in 1987, although there are gaps in the data. The training of member country nationals is an important part of the programme.

In 1990, buoys were deployed for the first time in Tuvalu and Vanuatu. The buoys in Western Samoa and Cook Islands had to be redeployed after interference with their moorings.

Part of a coastal and nearshore map of Western Samoa being prepared for publication.

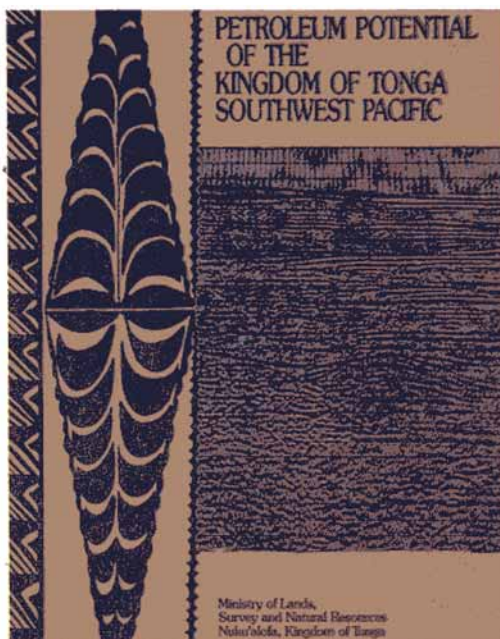


HYDROCARBON PROGRAMME

The overall objective of this programme is to promote hydrocarbon exploration and development in SOPAC member countries. The first step towards this is to evaluate the hydrocarbon potential of member countries with suitable sedimentary basins. This includes source-rock, reservoir-rock and stratigraphic studies, as well as reprocessing of seismic data. SOPAC then promotes further exploration in these countries where conditions for hydrocarbon accumulations appear to be favourable. Training of member country nationals in modern techniques for hydrocarbon exploration is also offered, as well as assistance to the member countries in non-technical aspects of the hydrocarbon exploration industry, such as drafting of legislation and retrieval of basic exploration data.

Work for Fiji has concentrated on publishing hydrocarbon prospectivity assessments. A paper 'Structure and Petroleum Geology of the Bligh Water and Bau Waters Basins' was accepted for the forthcoming Circum-Pacific Council Earth Science Series Volume on the Geology and Offshore Resources of Pacific Island Arcs - Tonga Region II. Another paper 'Petroleum Geology of Fiji' was submitted for publication in a special issue of 'Marine Geology' which follows the SOPAC-IOC Workshop in Canberra, September 1989. An interpretation of proprietary multi-channel seismic data from a sector of the Lau Ridge was also completed on a confidential basis. Advice and technical assistance was also given to the Fiji Mineral Resources Department during the year.

For the Solomon Islands, work has concentrated on promotion of petroleum prospects and assistance with finalising draft petroleum legislation. A paper that presents a reinterpretation of multichannel seismic data from Iron Bottom Sound, Guadalcanal, was submitted for publication in a special south-west Pacific issue of the journal 'Marine Geology'. A promotional colour brochure that summarises petroleum prospects in the Solomon Islands was published by SOPAC in late 1989.



Cover of the glossy brochure published in July promoting the petroleum prospects in the Kingdom of Tonga.

SOPAC provided assistance to Tonga with the publication this year of a colour brochure to promote the Kingdom's petroleum prospects.

Promotional posters on petroleum prospects in Tonga, Solomon Islands and Fiji were displayed at the First PNG Petroleum Convention, Port Moresby, 1990. This led to visits and detailed discussions with a large American oil company interested in prospects in Fiji, Vanuatu, Solomon Islands and Tonga. Posters on hydrocarbon prospects in Fiji and the Solomon Islands and promotional brochures on Tonga and the Solomon Islands were presented at the Fifth Circum-Pacific Energy and Mineral Resources Conference, Honolulu, 1990.

OFFSHORE PROGRAMME



Manganese nodules at a depth of 5200 m on the seafloor of the Penhryn Basin.

Seabed mapping of deep-water areas by research vessels provides fundamental data on the large, geologically complex and relatively unexplored EEZs of member countries and the South Pacific region as a whole. These investigations are closely linked to assessment of offshore mineral potential.

The main function of SOPAC's Offshore Programme is to coordinate the activities of foreign research vessels and ensure that member countries are kept fully informed on the activities, data collected and results of cruises in their waters. SOPAC also interprets seabed and bathymetric data, produces reconnaissance-scale maps of selected areas, evaluates areas with mineral potential and maintains databases on offshore minerals. Areas with mineral potential are promoted within the marine mining industry, and exploration is encouraged.

OFFSHORE MINERALS

Offshore minerals include cobalt-rich crusts, manganese nodules, polymetallic sulphides, metalliferous sediments, and seamount phosphates. The objectives of offshore minerals investigations at SOPAC are to:

- Evaluate the resource potential of areas with possible mineralisation that may constitute a resource within and outside of member countries' EEZs, and to inform the member countries of the possibilities of such resources within their waters.
- Coordinate and encourage research and exploration leading to resource information within the EEZs of member countries by research organisations and agencies outside of SOPAC.
- Promote those areas with mineral potential to the marine mining industry, and encourage exploration leading to exploitation within the interests of the member countries.

Since 1983, most investigations of cobalt-rich crusts have taken place in Kiribati, Tuvalu, Cook Islands, and Western Samoa. Data obtained so far indicate that some areas are promising prospects, but their full potential will probably not be known until there has been further sampling of crust thickness and mineral grade. Under the new five-year programme with Japan, begun this year, further study of crusts was carried out in Western Samoa on the RV *Hakurei Maru No 2*. The German RV *Sonne* collected cobalt-rich crusts in Phoenix Islands and Tuvalu.

Manganese nodule investigations have centred on areas in Kiribati, Tuvalu and the Cook Islands. Areas within the EEZs of Western Samoa and the southern Cook Islands were studied by the RV *Hakurei Maru No 2* this year. This work has established a comprehensive data base for much of the region.

Since 1985, hydrothermally-deposited metal sulphides and sediments have been discovered in neo-volcanic zones in the North Fiji, Lau, Manus and western Woodlark Basins. Intensive study in the region this year has used high technology equipment including submersibles.

The Japanese RV *Kaiyo* studied sulphide mineralisation in the back-arc troughs of Vanuatu and in the North Fiji Basin under the French-Japanese STARMER programme. The RV *Sonne* studied sulphide deposits in the central Lau Basin and in Manus Basin. The Russian RV *Keldysh*, with two MIR submersibles, studied deposits in northern Lau Basin, western Woodlark Basin and Manus Basin. On the basis of the earlier work, the University of Tokyo RV *Hakuho Maru* studied sulphide deposits in Manus Basin. Little is known of the quantities and value of minerals contained in these deposits, but marine sulphide deposits are prototypes of onshore deposits and provide much information for exploration both onshore and in the ocean.

The potential is high to find more deposits. In the Southwest Pacific, prospective sites fall within the EEZs of Tonga, Fiji, Vanuatu, Solomon Islands and Papua New Guinea.

SEABED MAPPING

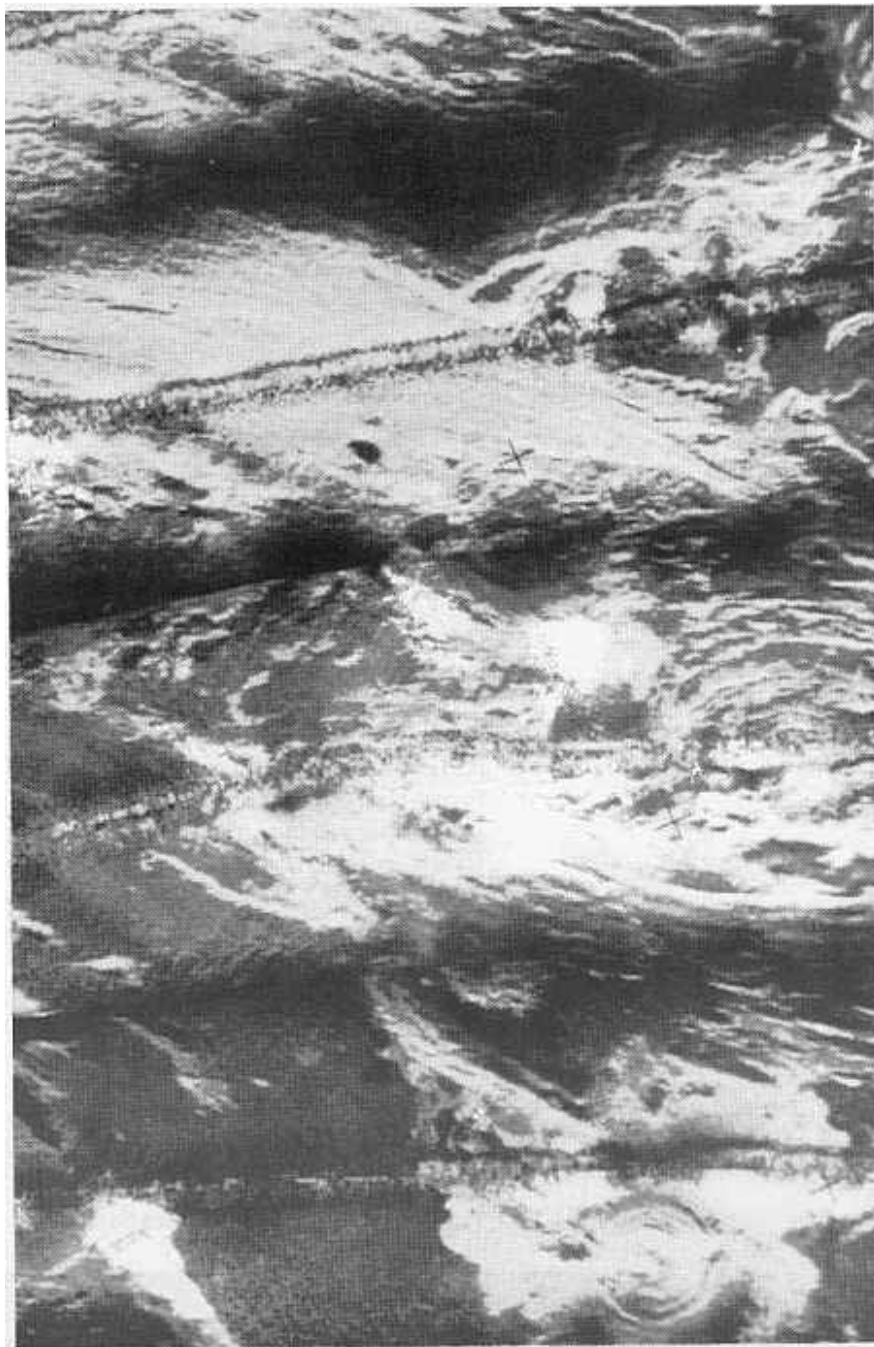
The main objectives of SOPAC's offshore seabed mapping are to :

- provide sidescan imagery and bathymetric information for resource assessments in the EEZs of member countries.
- map areas of the seafloor for ongoing SOPAC investigations and provide a basis for planning further work.

An important part of SOPAC's work is to compile bathymetric maps of the EEZs of its member countries and the contiguous areas of international waters between them. Since SOPAC published a compilation of the bathymetry of Southwest Pacific in 1983, much new bathymetric data have been collected in the region by various sources, and more data continue to be collected at a rapid rate.

A GLORIA survey was carried out in 1989 by SOPAC from HMAS *Cook* in areas of Vanuatu, Western Samoa, Fiji, Tonga and Solomon Islands. These data were interpreted during 1990 and the results will be published in 1991. Seabeam data have been collected in small areas of the EEZs of all member countries, including by the RV *Sonne* and RV *Kaiyo* in 1989-90. SOPAC plans are proceeding towards another swath-mapping survey possibly in late 1991 using EC funds.

SOPAC will continue to obtain new data in areas of maximum interest and resource potential, and aims to maintain an up-to-date bathymetric compilation of the region that can be produced by computer at any scale.



A GLORIA image of the deep seafloor in the northern Lau Basin. The most conspicuous features are the linear active spreading centre and a circular caldera, about eight kilometres across, of a seafloor volcano.

TRAINING PROGRAMME

Training of member country nationals in earth science and marine geology, together with providing on-the-job training during Work Programme field studies, is one of the most important aspects of SOPAC's work. Training activities continue to develop and expand in scope. In early 1989, a five-year Training Plan for 1989-1993 was prepared and circulated to member countries and donors. The plan is discussed and refined at each Annual Session.

Training activities are grouped into Courses, On-the-job-assignments, Workshops, and Training assistance.

COURSES

The Certificate in Earth Science and Marine Geology is a three-year course held for three months each year. A new cycle began in 1990 with the Basic Earth Science and Marine Geology Course held at Techsec. Eighteen participants attended from Cook Islands, Fiji, Papua New Guinea, Solomon Islands, Tonga and Western Samoa. As part of this course, a 10-day special course on Introduction to Remote Sensing was organised jointly with the UNDP Sub-regional Remote Sensing Project.

The SOPAC Scholarship Scheme provides funds for first degree study at the University of Canterbury in New Zealand, the University of Hawaii, University of the South Pacific, and University of British Columbia in Canada. In 1990, scholarships were awarded to recipients from Cook Islands, Fiji, Solomon Islands, Tuvalu, Vanuatu, and Western Samoa.

ON-THE-JOB ASSIGNMENTS

Twelve fellowships were awarded under the SOPAC Fellowship Scheme. These included attachments to the drafting, library and management sections of Techsec, and to Techsec coastal and nearshore field survey teams. The attachments were for periods of one week up to two months.

The SOPAC Management Training Scheme provides training for member country representatives during the SOPAC Annual Session. A Junior Professional Management Training Project will enable a junior professional staff member to attend the Annual Session together with the national representatives. A Senior Management Training Project will cover the travel costs for the national representatives to attend the Annual Session. This will assist with the need for the national representatives to discuss the scientific and technical aspects of the work programme with Techsec staff, other technical advisers, and each other.

Training during field work and cruises takes place as opportunities arise. During the past twelve months, nine island nationals from the Cook Islands, Fiji, Kiribati, Tonga, and Western Samoa, participated in work on board the RVs *Kaiyo*, *Sonne* and *Hakurei Maru No 2*. Those from Kiribati and Fiji who participated in the *Hakurei Maru No 2* and *Kaiyo* cruises respectively, visited Geological Survey of Japan for a month of follow-up work. Island nationals from Fiji and Solomon Islands were funded to attend the PACRIM conference in Australia.



Levelling in a tide gauge on Yasawa Island, Fiji. This job was part of an extensive survey which included on-the-job training for island nationals.

WORKSHOPS

The 1990 SOPAC Coastal Mapping Workshop was held on Guam. Its objectives were to train member country participants in the techniques of mapping the coastal and nearshore zone and to carry out a coastal survey of Guam. Ten participants from eight member countries used aerial photographs to map historical changes in the coastal environment. Beach profiles were established on Cocos Island in areas of coastal erosion and maps of the coastal morphology were produced.

An additional workshop is run in conjunction with each Annual Session. The Workshop on Coastal Investigations and Engineering was held at Nadi, Funafuti and Tarawa in September, attended by 21 participants from all island member countries.

Funding has enabled several additional workshops to be held during the past twelve months. A regional Deep Sea Minerals Exploration Cruise/Workshop was held onboard the RV *Sonne* in the northern Lau Basin area, followed by a three-day workshop at Nukualofa. A regional Workshop on Mineral Exploration, with an emphasis on gold, was held in the Wau/Bulolo Goldfields area of Papua New Guinea. Eighteen participants from Fiji, Solomon Islands, Vanuatu, Tonga and Papua New Guinea attended.

A national Workshop on Coastal Mapping was held for 25 physical planning students at the College of Higher Education in the Solomon Islands. A national Workshop for Papua New Guinea on Introduction to Petroleum Geology was held for 13 geologists from the Department of Minerals and Energy and the oil companies. A field trip visited the Iagafu oil-bearing structure in the Southern Highlands.

TRAINING ASSISTANCE

Techsec continues to assist with the Ocean Resource Management Programme. Continuing discussions have been held with the UNDP Regional Water Resources Project with regard to incorporating the regional training needs in hydrogeology with those of existing SOPAC training activities.



Participants at the 1990 CIDA-SOPAC Coastal Mapping Workshop inspecting beach erosion at Betio, Kiribati. WW II maps show that the beach in the foreground was level with the gun emplacement at the time. In atoll countries such as Kiribati, there can be significant coastline changes within such a period that are the result of natural processes.

TECHNICAL SUPPORT PROGRAMME

DATA MANAGEMENT

The objectives of Data Management are to:

- locate all data collected in the SOPAC region that is relevant to the Work Programme and to establish the type and quality of that data.
- acquire copies of data that are not readily accessible or data that are required for reassessment by Techsec.
- digitise data held at Techsec and store on computer.
- provide data processing facilities at Techsec.
- provide member countries with data and information on data held at Techsec on request.
- assist member countries to develop management systems for their own data.

Priority has been given to obtaining new offshore cruise data not available from World Data Centre-A for Marine Geophysical Data, particularly from Japan, Germany, Australia and New Zealand, and to preparing computer programmes needed to process these data. Many of the data first have to be processed and reduced to a standard format from highly heterogeneous sources. The northward extension of the database to account for new SOPAC member states will result in about 200 more cruises to be loaded.

A long term agreement has been reached by which SOPAC Data Management will receive continued assistance from ORSTOM in Noumea, particularly for developing computer applications for offshore data.

TECHNICAL INFORMATION

Technical Information services include publication and distribution of Techsec reports, drafting and map production, and the provision of Library services.

The desk-top publishing system at Techsec has improved the quality of routine publications and has allowed in-house preparation of a range of special-purpose documents such as poster displays, the SOPAC Newsletter, publicity material, and promotional brochures. "SOPAC Projects" is a new publication that gives short, readable summaries of key SOPAC reports. It is aimed at providing digestible information to government representatives, funding agencies and other interested parties, as well as keeping scientific audiences informed of the general results of the Work Programme.

The demand for drafting services at Techsec keeps two staff fully occupied on illustrations for reports and other publications, and the preparation of maps. Increasingly, computers are being used for drafting and graphics work, especially line work on maps. Preparation of promotional and display material, including poster papers and brochures, is also part of the work. Training support given by the Chief Draftsman includes courses for member country nationals at Techsec and instruction at coastal mapping workshops.

A specialist library is now operational at the Technical Secretariat, and includes the provision of information services to improve the effectiveness of marine geological researchers and other users of geological information in the South Pacific region.

Specific objectives of the library services include:

- implementation of computerised cataloguing and classification systems for the Techsec library and map collections
- maintaining a bibliographic database on non-living marine regional resources materials relevant to the SOPAC Work Programme, in close association with the Pacific Islands Marine Resources Information Service (PIMRIS) at the University of the South Pacific
- assisting member countries with their geology libraries as part of the SOPAC Work Programme.

The library document, map and aerial photograph collection has now been completely classified and databases of holdings established. The library system now contains over 4000 records, about half of which form the basis for the bibliography on non-living marine resources which has been used to assist PIMRIS (Pacific Islands Marine Resources Information System) to compile marine science information packages for distribution in the region. SOPAC member countries Solomon Islands, Fiji, Western Samoa and Kiribati received assistance with their geology libraries during 1990.

After training in Canada, an island national is now Assistant Librarian at Techsec and will take over as Librarian in 1992.

TECHNICAL SERVICES

The wide variety of activities undertaken in the member countries requires a large inventory of geophysical instruments and its associated support equipment to be available at Techsec for use on the surveys that are conducted throughout the region each year. Major equipment includes a sub-bottom profiler and depth sounder, towed magnetometer and side-scan sonar, various position-fixing systems, underwater observation and photographic systems, and a range of bottom sampling and physical oceanographic equipment.

To maintain this range of electronic and mechanical systems in an operational state, as well as to provide assistance during field surveys, a service facility with qualified personnel has been established at Techsec. Survey coordination includes scheduling the appropriate mode of shipping to and from the member country; organising, testing, and sometimes customising the appropriate systems and support items prior to the actual survey; mobilising the equipment at the survey site and assisting with the operation of the survey; preparing the equipment for shipment back to Techsec; and finally, intercepting the equipment to commence the maintenance, repair and calibration cycle once again. Support services also include maintaining the computer systems installed at Techsec.

An increasing amount of the Electronic Engineer's time is spent training member country nationals in the operation, maintenance and repair of a wide variety of field equipment.



Setting up GPS navigation equipment for a seabed mapping survey in the Yasawa Islands, Fiji.

APPENDIX 1

TECHNICAL SECRETARIAT STAFF LIST

Position	Incumbent	Funding
MANAGEMENT		
Director	Jioji Kotobalavu	SOPAC
Deputy Director	Jim Eade	Australia
Finance & Administration Controller	Recruiting	SOPAC
Programme Coordinator	Recruiting	EC
Executive Secretary	Jean Brown	SOPAC
Senior Technical Secretary	Laisa Baravilala	SOPAC
TECHNICAL PROGRAMMES		
Coastal and Nearshore Programme		
Coastal Geologist	Doug Rearic	USGS
Coastal Geologist	Rick Gillie	ICOD
Coastal Engineer	Brendan Holden	CIDA
Marine Geologist	Robert Smith	CFTC
Marine Geologist	Bill Collins	ICOD
Remote Sensing Geologist	Recruiting	France
Wave Engineer	Egil Olsen	Norway
Hydrocarbon Programme		
Petroleum Coordinator	Recruiting	CFTC
Petroleum Geophysicist	Recruiting	CIDA
Offshore Programme		
Offshore Coordinator	Don Tiffin	CIDA
Offshore Geologist	Yasumasa Kinoshita	Japan
Training Programme		
Training Coordinator	Russell Howorth	ESCAP/UNDP
Assistant Training Coordinator	Recruiting	EC
Technical Support Programme		
<i>Data Management</i>		
Data Manager	Yann Morel	France
Computer Geologist	Bertrand Medina	France
Computer Operator	Bougainville Bakoso	France
<i>Technical Information</i>		
Technical Editor	Alan Sherwood	NZ
Assistant Editor	Lala Bukarau	EC
Librarian	Heather Creech	ICOD
Assistant Librarian	Dillie George	ICOD/SOPAC
Chief Draftsman	Phil Woodward	Australia
Draftsman	Niko Naibitakele	ESCAP/UNDP
<i>Technical Services</i>		
Electronics Engineer	Ed Saphore	ESCAP/UNDP
Senior Electronics Technician	Recruiting	EC
Electronics Technician	Peni Musunamasi	ESCAP/UNDP
Marine Mechanic	Joseph Mausio	EC
Senior Geology Technician	Sekove Motuiwaca	ESCAP/UNDP
Technical Support Assistant	Recruiting	EC
Workshop Assistant	Setareki Ratu	SOPAC

Position	Incumbent	Funding
<i>Technical Secretaries</i>		
Technical Secretary	Litia Waradi	EC
Technical Secretary	Lavenia Kamali	EC
Technical Secretary	Ann Nata	EC
Technical Secretary	Sunita Prasad	EC

FINANCE AND ADMINISTRATION SUPPORT

Accountant	Kamlesh P Sharma	SOPAC
Administrative Assistant	Nazmeen Whippy	SOPAC
Accounts Clerk	Mereani Cavalevu	SOPAC
Secretary/Registry Clerk	Annette Olssen	SOPAC
Receptionist/Clerk	Unaia Bainiloga	SOPAC
Driver/Clerk	Enele Gaunavou	SOPAC
Cleaner/Office Assistant	Niu Daurewa	SOPAC
Watchman/Security	Temo Cama	SOPAC
	Watisoni Tuberi	SOPAC
	Inoke Sogo	SOPAC

APPENDIX 2

1990 BUDGET

ANTICIPATED INCOME AND APPLICATION OF FUNDS

ANTICIPATED SOURCE	GRAND TOTAL	TOTAL	EXECUTIVE MANAGEMENT	COASTAL AND NEARSHORE PROGRAMME		HYDROCARBON PROGRAMME
				NEARSHORE MINERALS	COASTAL DEVELOPMENT	
Member Countries	282,250	GPF 107,250 IK 175,000	83,250	30,000	30,000	30,000
Australia	508,360	GPF 178,121 SPF 255,389 IK 74,850	92,151 138,714		10,000	5,000
New Zealand	360,280	GPF 118,238 SPF 242,042 IK 0	32,400	5,000 45,250	45,250	
Fiji	173,105	GPF 64,635 SPF 108,470 IK 0	44,620 108,470			
France	1,283,330	GPF 36,625 SPF 96,705 IK 1,150,000				
France (IFREMER)	22,225	SPF 22,225 IK 0				
Japan (JICA)	1,016,280	GPF 8,280 IK 1,008,000		108,000		
Norway	541,660	GPF 36,020 SPF 75,000 IK 430,640			45,000 430,640	
West Germany	450,000	IK 450,000				
CFTC	266,278	GPF 5,675 SPF 60,603 IK 200,000		4,760 100,000		4,760 100,000
EEC	1,442,664	GPF 34,596 SPF 1,408,068 IK 0		271,250		26,350
Canada (CIDA) Hydrocarbons Coastal Offshore	1,040,415	GPF 83,545 SPF 956,870 IK 0			304,320	494,740
Canada (ICOD/CIDA) Nearshore Minerals	480,690	GPF 50,580 SPF 430,110 IK 0		430,110		
Canada (ICOD/CIDA) Training	351,520	GPF 31,152 SPF 320,368 IK 0				
UNDP	656,315	GPF 8,070 SPF 72,640 IK 575,605			100,000	
United States (USGS)	550,000	IK 550,000			100,000	
Canada (ICOD) Technical Information	103,485	GPF 9,300 SPF 70,930 IK 23,255				
Canada (ICOD) Technical Information Additional	15,000	SPF 15,000 IK 0				
Miscellaneous	45,280	GPF 45,280 IK 0	17,000			
Brought forward from 1989	63,579	GPF 63,579 IK 0	22,000			
TOTAL BUDGET	9,652,716	9,652,716	538,605	994,370	1,065,210	660,850

GPF - General Purpose Fund SPF - Special Purpose Fund IK - In-Kind Contribution

OFFSHORE PROGRAMME		TRAINING PROGRAMME	TECHNICAL SUPPORT PROGRAMME			FINANCE, ADMINISTRATION AND SPECIAL SUPPORT SERVICES
MAPPING	OFFSHORE MINERALS		DATA MANAGEMENT	TECHNICAL INFORMATION	TECHNICAL SERVICES	
						24,000
20,000	30,000	35,000				
		10,000		5,000 66,675 74,850		55,970 50,000
		61,542		25,000 90,000	33,000	22,838
					10,435	9,580
					19,325	17,300
20,000 100,000 *	750,000		76,705 300,000			
			22,225			
						8,280
300,000	600,000					
		30,000				36,020
	450,000					
		51,083				5,675
535,060	25,575	157,635		207,080	11,565 140,368	23,031 44,750
	157,810			8,950 5,235 8,955	8,255 4,650 4,650	14,070 14,390 14,390
				6,975	20,930	22,675
		320,368				31,152
		72,640 172,920		18,000	169,315	8,070 115,370
225,000	225,000					
				70,930 23,255		9,300
				15,000		
					5,000	23,280
					25,000	16,579
1,200,060	2,238,385	911,188	398,930	625,905	452,493	566,720

* Coastal and Nearshore mapping

APPENDIX 3

FINANCIAL STATEMENTS



Peat Marwick

Chartered Accountants

Level 5, ANZ House
Victoria Pde
Suva
Fiji

GPO Box 32
Suva
Fiji

Telephone Fiji 301155
Telefax No 301312

SOUTH PACIFIC
APPLIED GEOSCIENCE COMMISSION (SOPAC)

STATEMENT BY THE DIRECTOR OF THE COMMISSION

On behalf of the Commission, I state that in my opinion the accompanying accounts of the Commission set out on pages 29 to 33 are drawn up so as to give a true and fair view of the state of affairs of the Commission as at 31 December 1989 and of its results for the year then ended.

DATE: 17 May, 1990.

DIRECTOR: 

AUDITORS' REPORT TO THE MEMBERS

We report on the accompanying accounts set out on pages 29 to 33 of THE SOUTH PACIFIC APPLIED GEOSCIENCE COMMISSION (SOPAC) for the year ended 31 December 1989.

In our opinion:

- (a) the accounts are in agreement with the accounting records.
- (b) to the best of our information and according to the explanations given to us, the accompanying accounts give a true and fair view of the state of affairs of the Commission as at 31 December 1989 and of the net surplus of the Commission for the year ended on that date.

We have obtained all the information and explanations which to the best of our knowledge and belief were necessary for the purposes of our audit.

17 May 1990

SUVA, FIJI



KPMG PEAT MARWICK
CHARTERED ACCOUNTANTS



Member Firm of
Klynveld Peat Marwick Goerdeler

Resident Partners :
David Rogers, Suva
Brian Murphy, Suva
Vishnu Deo, Lautoka

SOUTH PACIFIC
APPLIED GEOSCIENCE COMMISSION (SOPAC)

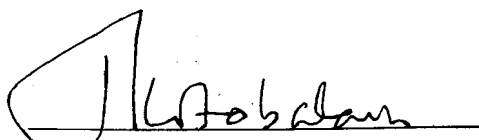
BALANCE SHEET AS AT 31 DECEMBER 1989

	Note	1989 \$	1988 \$
General funds		515,029	505,951
Special fund deposits	2	704,310	342,334
TOTAL FUNDS EMPLOYED		1,219,339	848,285
Represented by:			
CURRENT ASSETS			
Cash at bank	3	43,881	104,638
Term deposits	4	758,000	700,000
- Fiji	5	162,460	-
- other	6	11,879	6,316
Advances	7	163,119	140,439
Receivables	7	43,018	41,047
- Fiji government			
- Member countries	8	279,109	-
Sundry debtors			
TOTAL ASSETS		1,461,466	992,440
LESS CURRENT LIABILITIES			
PAYE		145,720	136,420
Basic Tax		13,847	4,019
Housing Authority		-	400
FNPF		-	3,316
Sundry creditors and accruals	9	82,560	-
		242,127	144,155
NET ASSETS		1,219,339	848,285

Contingent liabilities and commitments

10

This balance sheet is to be read in conjunction with the notes to and forming part of the accounts set out on pages 30 to 33.


DIRECTOR

**REVENUE AND EXPENDITURE ACCOUNT
FOR THE YEAR ENDED 31 DECEMBER 1989**

	1989 \$	1988 \$
Net surplus for the year	371,054	507,576
Add surplus balance at beginning of year	848,285	340,709
	1,219,339	848,285
Less special fund deposits	704,310	342,334
Balance at end of year	515,029	505,951

The statement of revenue and expenditure is to be read in conjunction with the notes to and forming part of the accounts set out on pages 30 to 33.

**NOTES TO AND FORMING PART OF THE ACCOUNTS
FOR THE YEAR ENDED 31 DECEMBER 1989**

1. STATEMENT OF ACCOUNTING POLICIES

The accounts have been prepared on an accrual basis, in accordance with the Commission's regulations.

Set out hereunder are the significant accounting policies adopted in the preparation of the accounts for the year ended 31 December 1989. Except where stated, the accounting policies have been consistently applied.

(a) Change in Accounting Policy

In 1988 an accrual basis of accounting was adopted to the extent that the Fiji Government's contributions both in respect of past and current grants which are based on the tax liability of Fiji staff were included and shown separately in the accounts. This year full accrual accounting has been adopted. Had accounts been prepared based on the previous years accounting policy, the net surplus for the current year would have been \$174,505.

(b) Fixed Assets

Purchases of fixed assets are expensed during the year as the accounts primary purpose is to show the expenditure of funds received. Fixed assets are controlled and accounted for by way of a fixed assets register and periodical physical inspection.

(c) Currency used in Accounts

The amounts reflected in the financial statements are stated in Fijian currency.

**NOTES TO AND FORMING PART OF THE ACCOUNTS
FOR THE YEAR ENDED 31 DECEMBER 1989 (Cont'd)**

(d) Exchange Rates

Exchange rates prevailing at the balance date have been used to convert all foreign dollar investments to the local currency.

(e) Income Tax

Under Section 17(24) of the Fiji Income Tax Act, SOPAC is exempt from income tax.

2. SPECIAL FUND DEPOSITS

These comprise of unspent cash balances of special purpose funds.

	1989	1988
	\$	\$
Tripartite II contributions SOPAC	2,771	4,667
Tripartite II contributions Australia	1,551	7,589
SPREP contributions to joint projects	2,509	2,509
Commonwealth foundation	561	561
CFTC - Nugent	1,770	2,606
CFTC - Smith	1,066	--
ICOD - IMPG	--	28,124
CCOP/SOPAC fellowship fund	--	15,876
Publications revolving fund	2,417	2,236
Sand resource survey - Western Samoa	--	71,448
Drilling core sampling in Tonga	--	17,874
Australian extra budgetary assistance		
Buildings	--	28,929
Satellite imagery processing	--	8,616
UN grant scholarships	9,371	28,180
ICOD nearshore minerals workshop	4,674	7,036
Technical information services	43,184	45,533
French funds	98,930	70,550
ICOD - Nearshore Minerals	147,159	--
NZ - Special Country Projects	80,382	--
IOC - Workshop	5,922	--
Necor Foundation - Rarotonga Workshop	8,327	--
Accounting systems	5,856	--
Tuvalu dredging project	287,860	--
	704,310	342,334

3. CASH AT BANK

This comprises of balances in the operating accounts made up of as follows:

		1989	1988
		F\$	F\$
BANK	CURRENCY OF ACCOUNT		
Bank of New Zealand	- Fiji Dollar	16,708	79,728
National Bank of Fiji	- Fiji Dollar	17,397	20,582
Bank of New Zealand	- US Dollar	147	4,328
Bank of New Zealand	- Australian Dollar	9,629	--
		43,881	104,638

**NOTES TO AND FORMING PART OF THE ACCOUNTS
FOR THE YEAR ENDED 31 DECEMBER 1989 (Cont'd)**

8. SUNDRY DEBTORS

1989	1988
\$	\$

These comprise of balances due as follows:

General Purpose Fund:

Customs Department - refund due	591	--
European Economic Community	62,839	--
United Nations Development Programme	7,651	--
International Centre for Ocean Development	24,636	--
France	17,848	--
United States Agency for International Development	11,211	--
Norway	19,486	--
Bank of New Zealand - interest receivable	8,215	--
National Bank of Fiji - interest receivable	7,808	--

Special Purpose Fund:

France	118,824	--
	279,109	--

9. SUNDRY CREDITORS AND ACCRUALS

These comprise of balances owing at balance date and accrued in the accounts for 1989 (1988 - Obligations not accrued, \$29,760).

10. CONTINGENT LIABILITIES

This relates to a Bank Guarantee of \$4,000 issued to the Fiji Electricity Authority by Bank of New Zealand for supply of electricity at SOPAC (Technical Secretariat) (1988 \$Nil).

11. CHANGE OF ORGANISATION NAME

The organisation changed its name from Committee for Co-ordination of Joint Prospecting for Mineral Resources in the South Pacific Offshore Areas (CCOP/SOPAC) to South Pacific Applied Geoscience Commission (SOPAC).



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DISCLAIMER

The additional financial data presented on pages 35 to 36 is in accordance with the books and records of THE SOUTH PACIFIC APPLIED GEOSCIENCE COMMISSION (SOPAC) which have been subjected to the auditing procedures applied in our audit of the Commission for the year ended 31 December 1989. It will be appreciated that our audit did not cover all details of the additional financial data. Accordingly, we do not express an opinion on such financial data and no warranty of accuracy or reliability is given.

In accordance with our firm policy, we advise that neither the firm nor any member or employee of the firm undertakes responsibility arising in any way whatsoever to any person (other than the Commission) in respect of such data, including any errors or omissions therein, arising through negligence or otherwise however caused.

17 May 1990

SUVA, FIJI

KPMG Peat Marwick

KPMG PEAT MARWICK
CHARTERED ACCOUNTANTS



Member Firm of
Klynveld Peat Marwick Goerdeler

Resident Partners :
David Rogers, Suva
Brian Murphy, Suva
Vishnu Deo, Lautoka

**DETAILED STATEMENT OF REVENUE AND EXPENDITURE
FOR THE YEAR ENDED 31 DECEMBER 1989**

	1989 \$	1988 \$
REVENUE		
Member country contributions - received	82,000	84,231
- receivable	25,250	41,047
Other contributions (see Schedule)	2,135,006	1,702,810
Programme administration support	99,339	61,015
Interest from investments	70,913	29,884
Interest from operating account	3,609	3,603
Other revenue (see Schedule)	18,495	13,577
TOTAL REVENUE	2,434,612	1,936,167
RECURRENT EXPENDITURE		
Institution costs		
Management staff salaries	80,893	36,886
Management staff allowances and costs	225,771	68,168
Finance/Administrative staff salaries	53,139	69,534
Fin/Admin staff allowances and costs	33,353	47,683
Audit	898	--
Recruitment	3,427	--
Travel	27,126	10,563
Equipment and furniture	3,279	5,810
General operating expenses	29,361	37,880
Recurring expenses	29,757	40,499
Chairman's Funds	4,579	--
Hospitality	7,917	--
Sub-Committee Expenses	8,885	--
	508,385	317,023
Programme costs		
Professional staff salaries	75,801	56,764
Professional staff allowances and costs	126,188	113,339
Consultants	83,863	35,865
Technical staff salaries	83,828	47,715
Technical staff allowances and costs	51,499	19,392
Audit	8,682	--
Recruitment and Repatriation	6,426	22,557
Travel	189,363	95,946
Equipment	202,710	123,187
General operating expenses	87,615	48,427
Printing and reporting	4,517	10,252
Recurring expenses	14,426	--
Information services	105,356	12,651
Field activities	134,871	20,745
Training	277,642	208,825
	1,452,787	815,665
ADDITIONAL PROGRAMME COSTS		
IFREMER/France programme support	22,929	--
SPECIAL EXPENDITURE		
17th Annual Session	--	22,712
Write - Off Debtors	20,768	--

DETAILED STATEMENT OF REVENUE AND EXPENDITURE (continued)

	1989 \$	1988 \$
CAPITAL EXPENDITURE		
Buildings	28,929	26,342
	2,033,798	1,181,742
ABNORMAL		
Tax effect on Fiji salaries taken up equivalent to Fiji Government grant Obligations for 1988	— 29,760	246,849 —
TOTAL EXPENDITURE	2,063,558	1,428,591
NET SURPLUS FOR THE YEAR	371,054	507,576

SCHEDULE OF OTHER CONTRIBUTIONS

	1989 \$	1988 \$
Australia	763,035	497,814
New Zealand	349,429	341,586
France	317,902	140,907
Japan	8,280	7,200
Fiji - grant	159,349	246,849
- other	—	46,449
International Centre for Ocean Development	286,777	234,472
Petro-Canada International Assistance Co-operation (PCIAC)	—	67,137
Commonwealth Fund for Technical Co-operation (CFTC)	55,584	48,000
Canadian International Development Agency (CIDA)	—	6,979
United States Development Agency (US AID)	11,211	4,500
United National Development Fund	58,162	60,917
Norway	50,464	—
EEC	62,839	—
IOC	11,974	—
	2,135,006	1,702,810

SCHEDULE OF OTHER REVENUE

	1989 \$	1988 \$
Customs refunds	4,003	4,619
Sale of publications	180	1,653
Sale of jackets and caps	424	243
Course fees	1,400	2,102
Refunds	3,289	3,674
USD Account	4,518	—
Exchange Gain	2,155	—
Sundries	2,526	1,286
	18,495	13,577

