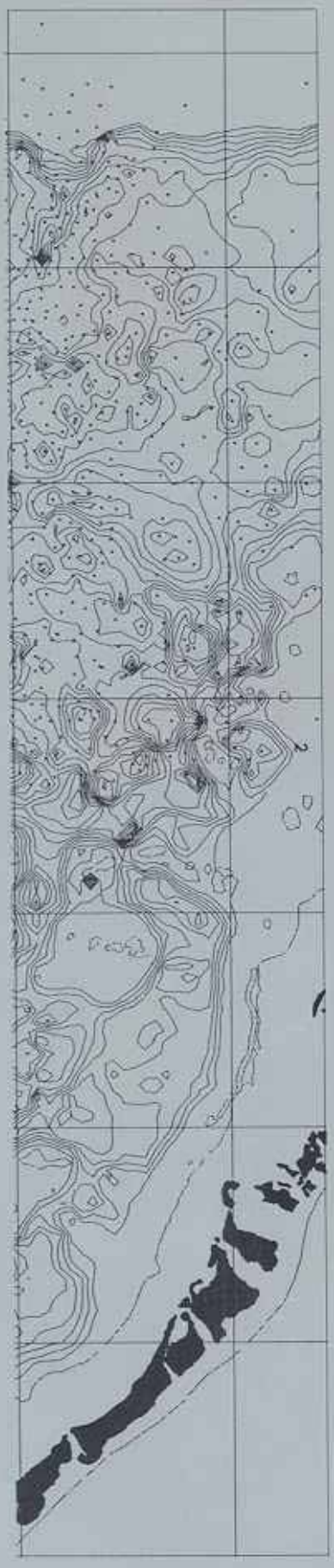

SOPAC

SOUTH PACIFIC
APPLIED GEOSCIENCE COMMISSION

1992

Annual Report Summary

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FOREWORD

Philipp Muller, Director

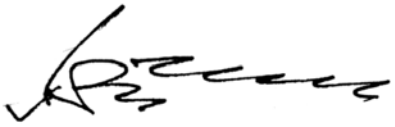
A very successful year has been completed despite considerable effort being expended in internal self-review and critical external evaluation. It is most heartening to find that SOPAC is a viable organisation and that its services are appreciated by member countries. Despite uncertainties in funding and personnel changes as a consequence as well as the unsettling effects of both new staff Terms and Conditions and external review and evaluation, a creditable output has been maintained. There is new awareness of member country needs and Secretariat activities are more focused on those needs.

SOPAC is now working in a climate where there are substantial numbers of development activities being planned or in progress. Many of these are taking place in the coastal environment where population pressures are increasing and where there are potentially conflicting needs and plans. The need for information with which to design sustainable and environmentally sound developments has never been greater.

The current world-wide recession is inhibiting development of non-living resources but in the South Pacific region this is compounded by extreme competition for development funds. Pacific Islands aspirations have been dulled by the decline in global demand for non-living resources and the fall of commercial interest in the region. Every effort has been made to maintain a high as possible profile of South Pacific mineral potential. Information on the non-living resources of the region and the legislative framework required for development is improving and must continue to do so, so that member countries will be ready for opportunities when they arise.

In the meantime countries will need continued support from donors to maintain growth. However, under the current recession donors are finding it harder to identify funds for development assistance. Those using and receiving aid funds must improve efficiency and be more accountable and SOPAC is no exception. Benefits must be clearly identifiable and work designed to produce maximum benefits. This means that of necessity greater effort must be spent on management, administration, and public awareness.

This is the operational environment which SOPAC finds itself in 1992. A major change being made as a response to this environment in which SOPAC must work is a new program structure. All work activities, management, administration, budgeting, fund raising, reporting, and general office operations at the Secretariat are being changed to fit this single new simplified program structure. All this is being done in an attempt to improve the service being provided at a time when resources from some sources are not increasing.



D.A.P. Muller CSI, AM
DIRECTOR

INTRODUCTION TO SOPAC

OBJECTIVES

SOPAC is an independent, inter-governmental, regional organisation established by the member countries to:

- provide information on the physical environment of coastal areas to assist with resource and environmental management, hazard evaluation and coastal protection works, and with planning and implementation of coastal development projects.
- investigate the resource potential of coastal and deep-sea minerals including construction materials, cobalt crusts, manganese nodules, polymetallic sulphides, 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 and manage the resulting data on behalf of member countries;
- train member country nationals and improve the institutional capabilities of member countries in the application of geoscience to the management and development of their non-living resources and coastal zone.

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. New Caledonia and French Polynesia are Associate Members.

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 inter-governmental body, changing its name to SOPAC (South Pacific Applied Geoscience Commission) in 1989.

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

SOPAC's Work Program is carried out by its Secretariat in close liaison and consultation with the member countries. The Secretariat is based in Suva, Fiji and currently has a staff of about 50.

The effects of natural processes on coastal infrastructure are a key aspect of SOPAC's work. These storm waves, their energy concentrated by an inappropriately designed sea wall, are threatening a road, the beach which originally provided a a natural buffer to erosion, and the wall itself.

SOPAC PROGRAM STRUCTURE

Coastal Program	Sub-Programs: Coastal Minerals Coastal Mapping Coastal Management Ocean Energy Field Support and Equipment
Hydrocarbon Program	Sub-Programs: Promotion to Industry Petroleum Evaluation Petroleum Data Management Petroleum Legislation
Offshore Program	Sub-Programs: Deep-sea Minerals Sea-bed Mapping Research Coordination
Onshore Program	Sub-Programs: Groundwater Resources Geohazards
Training Program	Sub-Programs: Certificate Courses Scholarships Fellowships Workshops and Seminars Development Advice
Information Program	Sub-Programs: Cartography Publications Library Regional Data Centre
Management Program	Sub-Programs: Executive Management Finance and Administration

MANAGEMENT PROGRAM

During the last 12 months, management at the Secretariat has undergone some major changes, most notably a change of Director, implementation of new terms and conditions of service and new administrative instructions and staff regulations, a major review and evaluation of the SOPAC Work Program, and developments stemming from the closing of ICOD.

STAFFING

Mr Jioji Kotobalavu completed his second three year contract and departed the Secretariat on 10 January 1992. Mr Philipp Muller joined the Secretariat as Director on 23 January 1992. Mr Jim Eade started his second three year contract as Deputy Director on 1 March 1992.

Staffing changes had a substantial impact on the implementation of the Coastal Program. At the beginning of 1992, there were four scientists on staff and one vacant position. By the end of the year, there were only two scientists carrying out coastal work, with three vacancies. Despite all efforts, by the end of 1992 the Secretariat was unable to recruit suitable candidates for two Canadian-funded positions.

The withdrawal of French support for the Data Manager and establishment of the new position of Computer Systems Manager, together with evolving Work Program requirements, resulted in a change of emphasis during the year from Data Management, mainly in support of the Offshore Program, to the development of a Regional Data Centre providing database support for all programs.

Following conclusion of UNDP support, the position of Electronics Engineer became vacant in mid-1992. Workshop operations will be supervised by the Senior Electronics Technician by early 1993. The recruitment of a Technical Support Assistant has improved the efficiency of field operations by handling all aspects of shipping and receiving goods.

MEMBER COUNTRY VISITS

During the last 12 months management has visited Kiribati, New Caledonia, Solomon Islands, Tuvalu, Vanuatu, and Western Samoa, including three visits to Tuvalu by the Deputy Director to manage the Borrow Pit Infilling Pilot Project. Management visits in 1992 included:

February	Western Samoa
March	Tuvalu
June	Solomon Islands
June	Tuvalu
June	Kiribati
July	Vanuatu
September	Tonga, Western Samoa
November	Tuvalu

FINANCE

The annual budget of SOPAC is reviewed and set by the Governing Council at its Annual Session. At its Twentieth Annual Session in Port Vila in October 1991, the Governing Council approved a total Budget of F$9,724,211 for 1992. At its Twentyfirst Annual Session in Nuku'alofa in September-October 1992, the Governing Council approved a total Budget of F$9,976,957 for 1993. These budgets were to be covered as follows:

Contributions	1992 (F$)	1993 (F$)
Cash	6,684,935	8,999,657
In-kind	3,039,276	977,300
Total	9,724,211	9,976,957

In-kind assistance is the assessed value of indirect, non-monetary support provided by donors. Note that in both the 1992 and 1993 Approved Budgets, F$3.5M is included for a one-off swath mapping survey funded through the EC. The project has been deferred to 1993 and the cost has thus been carried forward into the 1993 Budget.

MANAGEMENT

New management systems have been established at the Secretariat following the Review and Evaluation of SOPAC. A new program structure involving more participation by program leaders

has been established. Beside providing management inputs to the technical work of the Secretariat, program leaders provide advice to management on the complete range of SOPAC activities. Programs represented include Coastal, Hydrocarbon and Offshore, Training and Information. The structure also incorporates an Onshore Program that could be considered in the future, as well as a Management Program.

Clearer directions and goals have been set and these are expressed in the Corporate Plan. This was developed during a one day meeting of Secretariat staff assisted by review team member John Baker. Also during the visit of the review team, a one day special review was made of the staffing and procedures of the Finance and Administration section. A preliminary assessment of the Secretariat's filing system was made in 1992, and changes to the system will be made to improve office efficiency.

WORK PROGRAM REVIEW

A major review and evaluation of the Secretariat and the implementation of the SOPAC Work Program took place in May 1992. A considerable amount of staff time was spent assisting members of the review team. Documentation was prepared to assist them and numerous meetings were held at the Secretariat.

Japan has provided considerable assistance towards SOPAC's Offshore Program. Through a joint agreement between SOPAC and Japan, the Hakurei Maru No.2 *has carried out extensive surveys for offshore minerals in the EEZs of several member countries.*

FUNDING

Most of SOPAC's income comes from project-based donor support, making the organisation vulnerable to changes in donor funding. In 1992, there were some major changes of donor support which have affected the implementation of the Work Program. In addition, there are increased demands for accountability, both to member countries and donors, for resources, results and benefits.

The flexibility that SOPAC has to allocate resources is limited by the size of the General Purpose Fund, which consists of less than 17% of the budget and made up from member country contributions and an administration charge on project funds. The SOPAC Governing Council will be addressing this issue over the coming year.

SOPAC will need to increase its efforts to attract donor support for its work in a climate of increasing competition for a decreasing pool of aid funds if it is to maintain its level of output.

Australia continues to provide substantial and increasing support for SOPAC. Currently Australia supports eight positions, four professional and four technical with most support going to coastal work, especially mapping and aerial photography, management and training. The ability of Australia to respond rapidly to urgent requests has proved most valuable. Regular contact with AIDAB is maintained through their office at the Australian Embassy in Suva.

Fiji continues to support SOPAC with an annual special grant. It also recently announced that it would contribute towards the cost of construction of the new SOPAC headquarters building to be built in Suva.

New Zealand has continued to maintain its strong support of SOPAC, especially for the Information and Training Programs, and for special coastal projects. A special one-off contribution was provided to SOPAC during the first half of 1992 to catch up on the timing

of payment of New Zealand funds. In recent years this had advanced toward the end of the year. Payment now will continue to be made at about the same time but will be for the following calendar year and not the current one. Regular contact with New Zealand is maintained through the New Zealand Embassy in Suva.

The news that the Canadian Government were closing ICOD came as a major shock. The full ramifications of this move are not yet fully known and will not be until 1993. All Canadian-funded projects have been affected, including the CIDA-funded C-SPOD programs. While funds under existing signed agreements are secure, no new agreements can be entered into or even discussed. Extensions, however, have been obtained for C-SPOD projects beyond the stated time limits using savings but remaining within the overall amount of funds approved. As a result it is now expected that there are sufficient existing funds to support all five professional Canadian positions until about the middle of 1993. SOPAC is therefore at risk of losing the funding of some if not all these staff positions unless a new system of requesting and administering assistance is established soon. SOPAC has been informed that the new system should be in place early in 1993. Canada currently supports five professional positions - Coastal Geologist, Marine Geologist, Coastal Engineer, Offshore Coordinator, Petroleum Geophysicist. A sixth position (Librarian) concluded in February 1992 with the successful completion of the ICOD supported Information Services project.

French Government support has remained strong for a number of years, but this year saw the unexpected loss of the Data Manager position, established in 1978. However a new position, Mapping Geologist, has been established and was filled in September 1992. This will provide valuable support for SOPAC's mapping programs, especially in coastal areas, and the use of computers and GIS software will enhance and expand the SOPAC Work Program. Support from French institutions IFREMER and ORSTOM remains strong with continuing cash and in-kind support. French support is coordinated by the French Embassy in Suva. During April 1992 the Deputy Director visited the Ministry of Foreign Affairs (Scientific & Technical Cooperation Service), and ORSTOM and IFREMER headquarters in Paris, and IFREMER's main technical complex in Brest.

Support from the Norwegian Government (NORAD) continued into 1992 with approval of a two year extension of the existing Wave Energy Program. The Deputy Director visited Norway in April 1992 to finalise details of the extended program and to sign the new agreement with NORAD on SOPAC's behalf. Under this agreement NORAD will provide NOK 4,760,000 (approximately F$1 million) to conclude wave measurement and wave climate studies, the setting up of the wave database at the Secretariat, and theoretical and practical training associated with all parts of the program. A new implementation system has been set up with OCEANOR being contracted to provide necessary services.

CFTC have affirmed their continuing interest in supporting two professional positions at the Secretariat. During the past 12 months these were Petroleum Coordinator and Marine Geologist. Support for the Marine Geologist position concluded in June 1992. Despite CFTC's willingness to follow the Marine Geologist by providing a Computer Systems Manager, SOPAC was not able to conclude these arrangements and has begun discussions with CFTC for support for a coastal engineering position in its place. During a visit to CFTC in London in April 1992 the Deputy Director was informed that CFTC was to have less funds available in 1992/1993 and may have difficulty in providing all the assistance it would normally expect. CFTC technical experts are provided with a small travel grant to assist with regional travel in connection with official duties.

EC funded projects under Lome III continue to have a major impact on the SOPAC Work Program. EC funding supports 10 staff positions at the Secretariat, provides major support to coastal field activities, and supports selected Training and Hydrocarbon activities. Substantial assistance is being provided to seabed mapping activities of the Offshore Program. Following successful completion of the GLORIA swath survey plans are well advanced for the next phase of swath mapping. Tenders for this work were approved by the EC Delegates Office in Suva and forwarded to Brussels in June 1992. Tender documentation for the purchase of equipment including computers was also forwarded to Brussels in June. Access to Lome III funds has

become considerably easier and more efficient with the assistance of the EC Program Coordinator who has now been at the Secretariat for just over a year. Submissions have been made to the EC for support under Lome IV. Priority has been given to Technical Assistance to ensure a continuation of present support. Other assistance requested includes funds for a new building, coastal management, human resource development, and hydrocarbon data collection.

UNDP/ESCAP institutional support ceased at the end of June 1992 following a six month extension to the project which was due to end at the end of 1991. Assistance during this final period was limited to support for the remaining five staff positions, two professional and three technical, and support for training. This marks the end of an era of substantial institutional assistance from UNDP and ESCAP starting with preliminary funding in 1974, reaching full project status in 1979, and reducing and phasing out in the period 1987 to 1992. A function was held at the Secretariat on Friday June 26 to mark the occasion. In the future UNDP funds will be available for project work under fifth cycle funding.

The US Geological Survey support to SOPAC was abruptly interrupted by the untimely death of Coastal Geologist Doug Rearic in September 1991. In April 1992 the Deputy Director visited the Pacific Marine Geology Branch in Palo Alto to renew contact with the USGS. As a result a request for continuing assistance has been forwarded and the USGS are attempting to identify a suitable candidate for the position of Coastal Geologist.

The Government of Japan provides substantial support for SOPAC's offshore work, including the services of an Offshore Geologist. Under a special joint agreement, Japan also provides two months survey time each year to investigate deep-sea mineral resources in the SOPAC region and produces substantial information and detailed reports stemming from this work.

Other supporting agencies and institutions visited by the Deputy Director in April included BGS, IOSDL, University of Leeds, and Imperial College in United Kingdom, and US State Department, NOAA, NSF, USGS, Scripps Institution of Oceanography, University of Hawaii, and East-West Center in the United States.

COASTAL PROGRAM

SOPAC's coastal field studies provide information on the physical aspects of the coastal environment. The work includes investigations of coastal mineral resources; assessment of geological and oceanographic processes and problems related to coastal erosion, protection, and development projects; and mapping the coastal zone. An important application of the work is to assist with coastal management by providing data against which any future coastal changes can be measured. Training in coastal mapping and the engineering aspects of coastal development improves in-country expertise.

A reduction of staff numbers constrained progress in the Coastal Program during 1992, and this trend is likely to continue in 1993.

COASTAL MINERALS

Coastal minerals include construction materials and detrital minerals.

SOPAC has an established program to evaluate construction material resources in the coastal zone. Increasing demand due to construction of wharves, jetties, seawalls, buildings, airports and landfill projects has

The growing demand for construction materials in Pacific island countries involves SOPAC in surveys of aggregate resources and the physical effects of their extraction on the coastal environment.

added tremendously to the pressure already placed on traditional sources of sand and aggregate such as beaches, reef flats, and storm deposits, resulting in environmental concerns for sustainable development.

A report summarising sand resources for Tongatapu, Tonga, was completed to provide a guide for the management of the limited onshore and extensive offshore sand deposits. Two maps were also prepared synthesising sand and gravel resources in Tongatapu lagoon. Recommendations made included an assessment of technical extraction methods and real long-term costs, both financial and environmental, of mining the offshore deposits. In Tuvalu, a pilot project is underway to dredge approximately 2,500 m^3 of sediment from the lagoon to fill a borrow pit

SOPAC also has an ongoing program to evaluate and encourage the exploration for potential detrital and placer minerals, especially gold and mineral sands. Regionally, work is focused primarily on the volcanic islands: Fiji, Vanuatu, Solomon Islands and Papua New Guinea. In 1992, geological and geophysical surveys were carried out in Solomon Islands, Fiji (Nadi Bay), and Vanuatu (Forari Bay).

SOPAC's Tuvalu Borrow Pit Infilling Pilot Project is being carried out jointly with the Tuvalu Public Works Department, and funded by the Australian International Development Assistance Bureau (AIDAB). The objectives of the project are to test the feasibility of using lagoon sediment as a fill material to reclaim the borrow pits and low-lying areas on Fongafale, the main island on Funafuti Atoll. These pits and low lying areas represent about 30% of the land area on Fongafale and are virtually useless in their present state.

SOPAC supervised the construction of a small airlift dredge, hopper barge and pusher tug in Suva, and the vessels were shipped to Tuvalu in March 1992. Dredging began late in March 1992 and despite a number of settling down problems, by November 1992 more than 700 m^3 of lagoon sediment had been dredged, transported to the fill site and dumped into one of the pits.

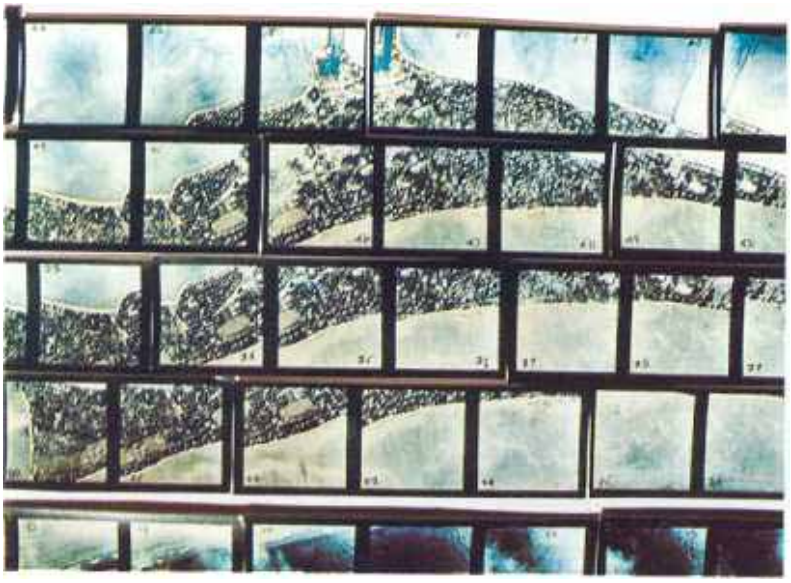
The effects of the pilot project on the environment are also being monitored to assist evaluation of the effects of the full scale project. Monitoring includes a study of the effects of dredging on fisheries, corals and other living organisms in the lagoon, being done for SOPAC by SPREP.

COASTAL MAPPING

SOPAC conducts geological, bathymetric, and air photo surveys of the coastal zones of member countries to produce maps for coastal management, development planning, coastal hazards protection, mineral exploration and resource assessment. These maps present a wide range of information so that it is readily available and easily understood and used. Maps are one of the major Work Program requests from SOPAC member countries.

SOPAC's in-house aerial photography capability is used extensively for coastal zone mapping, providing an important historical database for monitoring coastal changes such as erosion and the effects of coastal development projects. Member countries can also use the photographs for coastal management and land use planning. After a trial survey in Fiji in 1991, aerial surveys were completed in Western Samoa, Kiribati and Solomon Islands.

In 1992, preliminary coastal morphology maps were completed for Kiribati from the results of a coastal mapping workshop in Tarawa, Kiribati, providing a useful addition to existing data on Tarawa coastal geomorphology. Maps are in preparation from the results of the 1992 coastal



Air photo surveys, such as this recent SOPAC survey of Betio, Kiribati, are a valuable tool for coastal studies.

mapping workshop held in Federated States of Micronesia.

Lagoon bathymetry maps for Pukapuka and Rakahanga Islands in the Cook Islands were published, together with three maps of Tuvalu atolls: Funafuti, Nukufetau and Nukulaelae. Compilation was finalised for two sheets in a 1:250,000 bathymetric series for the Fiji Mineral Resources Department.

COASTAL MANAGEMENT

Coastal surveys carried out by SOPAC assess the interaction of geological and oceanographic processes with the effects of coastal infrastructure developments. The results are applied to engineering projects to optimise the design and operation of coastal structures and to minimise any possible adverse effects. Natural hazard impacts on the coastal zone from cyclones, storm surges, tsunamis, coastal erosion and sea level rise are also assessed.

In 1992, projects were completed in Kiribati, Cook Islands, Fiji, Vanuatu, Tuvalu.

Physical oceanographic studies of the environmental characteristics and processes of lagoons and oceans were completed in Ngatangiia Harbour, Muri Lagoon and Avarua Harbour (Cook Islands) and Port Havannah, Mele Bay and the Erakor lagoons (Vanuatu).

SOPAC investigations to assess the geological processes, both natural and human-induced, that operate in the coastal zone include historical air photo interpretation, beach profiling, coastal morphology, sediment budgets, review of the history of foreshore and harbour developments, and bathymetry. During 1992, studies were completed of beach processes and coastal stability of the Avarua-Avatiu coastline in the Cook Islands, Cuvu Bay in Fiji, Fongafale in Tuvalu, and Betio in Kiribati.

General and site-specific engineering information is collected by SOPAC for use in coastal development planning and for evaluation of specific sites for coastal engineering projects. This may range from advice on coastal protection measures to siting of coastal structures such as seawalls, groynes, jetties, wharves, sewer outfalls and other coastal infrastructure associated with human development. Engineering studies were conducted on coastal protection structures on Abaiang Atoll (Kiribati) and on a survey of a pipeline across the Rewa River, the effects of Cyclone Sina on coastal protection on Viti Levu, and silting up of the wharf basin on Rotuma (Fiji).

OCEAN ENERGY

The wave energy program is designed to establish a detailed database of measured wave parameters for sites in Cook Islands, Fiji, Tonga, Tuvalu, Vanuatu, and Western Samoa and set up that database at the Secretariat; to establish a regional wave climate for the central and South Pacific so that wave parameters can be calculated for any site in the region; and to train island nationals to use the information to assist in their country's development.

By September 1992, non-directional wave data sets were completed for Cook Islands, Tonga and Tuvalu, and directional wave data measurements completed in Tonga. Wave data reports for each country up to the end of 1991 were completed. Data collection is continuing in Fiji, Vanuatu and Western Samoa. Servicing and mooring problems with buoys have made it necessary to recover and redeploy buoys in all countries during the past year. The wave database is currently being maintained at OCEANOR in Trondheim, Norway, under contract to SOPAC, and a scientist from Fiji Energy Department has been trained in Norway in its operation and use. A regional wave climatology study was started in early 1992.

FIELD SUPPORT AND EQUIPMENT

A wide variety of field activities undertaken by SOPAC requires that a large inventory of geological, geophysical, oceanographic and navigational instruments and associated support equipment be available at the Secretariat for use on the surveys that are conducted throughout the region each year. This inventory of specialised equipment is a regional asset with a value exceeding F$1 million. The Secretariat also has the expertise, developed over two decades, to mobilise this equipment for use anywhere in the region.

In 1992, a total of 14 surveys were mobilised to eight member countries: Fiji, Kiribati, Papua New Guinea, Solomon Islands, Tuvalu, Tonga, Vanuatu and Western Samoa.

HYDROCARBON PROGRAM

The aim of SOPAC's Hydrocarbon Programme is to promote the region's hydrocarbon potential and so attract major oil companies. Five island member countries are considered to have good potential for hydrocarbons: Fiji, Papua New Guinea, Solomon Islands, Tonga and Vanuatu.

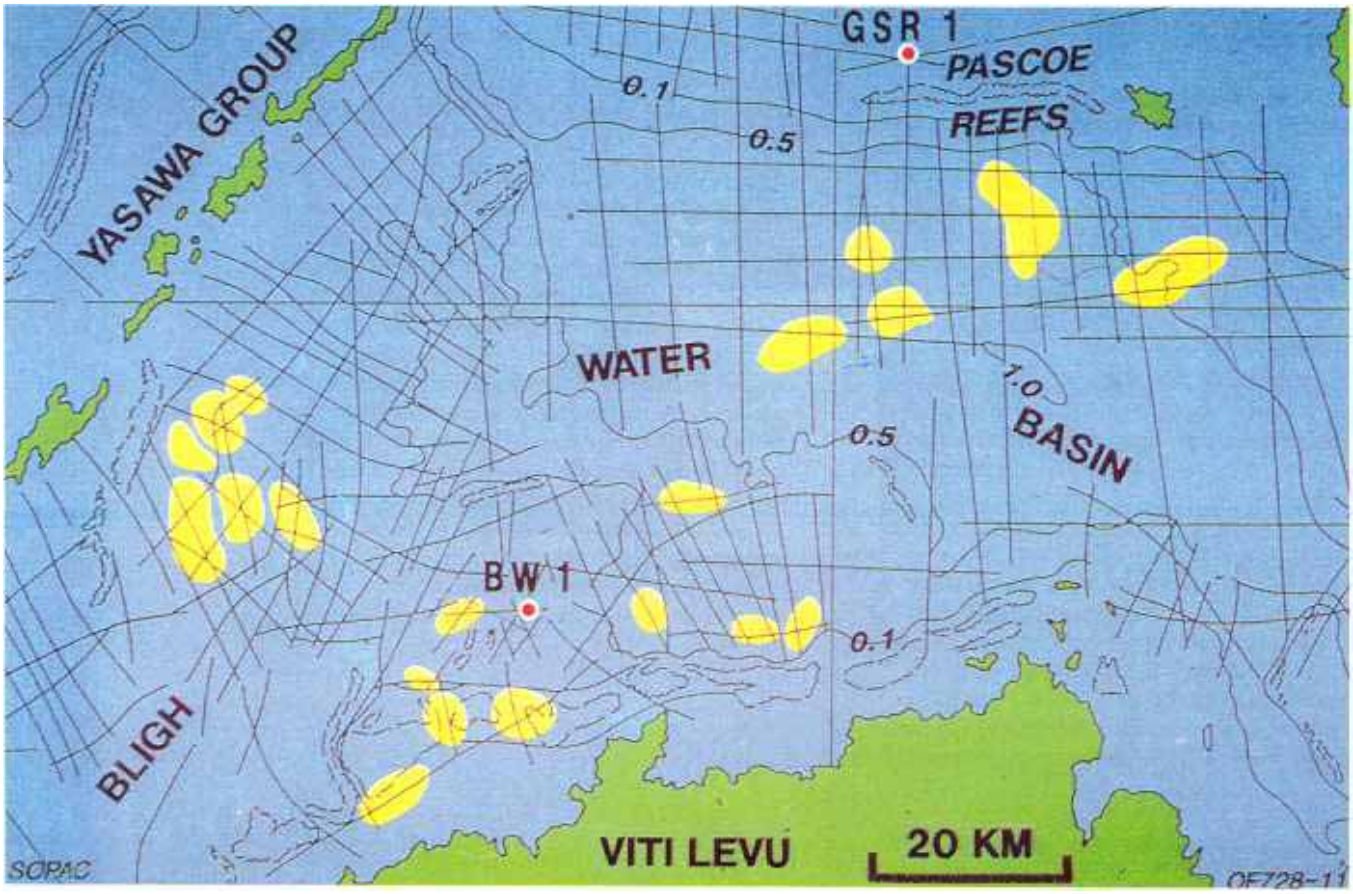
Work by SOPAC has enhanced the hydrocarbon prospects of the region through a better understanding of the geological setting, source rocks, hydrocarbon generation, reservoirs and seals. Much of this is due to reprocessing of seismic data using state-of-the-art technology and the application of new geological concepts. The results of these studies are promoted frequently at international oil industry conferences, in oil industry publications, in promotional brochures, and in SOPAC publications. In order to speed the supply of seismic and geological data to interested oil companies, Petroleum Data Packages are being set up at the SOPAC Data Bank at the Australian Geological Survey Organisation in Canberra.

Other important support provided by the Hydrocarbon Programme includes assistance with the retrieval of seismic data from oil companies, and the provision of data archiving and management facilities on behalf of member country governments. Assistance is also given with the development of member countries' hydrocarbon legislation and regulations in order to provide a sound legal and fiscal framework for hydrocarbon exploration and exploitation.

PROMOTION TO INDUSTRY

The hydrocarbon potential of SOPAC member countries was promoted at three major international oil industry conferences: AAPG, APEA, and CPCEMR. Talks were presented by the Secretariat on Fiji, Tonga, Solomon Islands and Vanuatu, and a visual display of the region's hydrocarbon potential was exhibited. These international conferences promote the region by focussing the attention of the oil industry on new exploration developments.

Masses of data, reports and maps relevant to hydrocarbon exploration have been produced for the region, but very little has been distributed to the oil industry. The purpose of SOPAC's



Potential reef reservoirs for hydrocarbons have been identified on seismic profile data from the Bligh Water Basin, Fiji.

Petroleum Data Packages is to contain all relevant non-confidential geological and geophysical data in a form which can be easily reproduced when ordered by interested oil companies. Petroleum data packages have been completed for the Solomon Islands and Vanuatu and are being compiled for Fiji and Tonga. Catalogues have been produced for the Solomon Islands and Vanuatu data packages and mailed to oil companies and consultants worldwide.

A brochure promoting the promising hydrocarbon potential of Vanuatu was produced jointly by the Secretariat, AGSO and the USGS, and mailed to over two hundred oil companies and consultants worldwide to raise the profile of Vanuatu and the region within the oil industry.

PETROLEUM EVALUATION

An evaluation of all seismic and geological data was completed on the Great Sea Reefs and Bligh Water areas of Fiji. Using new geological concepts, twenty-five reefal anomalies were identified, many for the first time, in the Bligh Water Basin. These represent possible traps for oil and/or gas and substantially increase the hydrocarbon potential of the area. Source rocks were identified in onshore outcrops and in strata drilled in three offshore wells. Together with the confirmation of oil shows in sea floor sediments in Bligh Water, these results are very encouraging for the generation of hydrocarbons in the offshore basins.

Work commenced in February on the first of a two phase seismic processing project for Vanuatu and Solomon Islands. Fourteen lines (650 km) of 1978 and 1982 data were processed through state-of-the-art techniques. Six were from Iron Bottom Basin and gave confirmation and increased definition of the reefal anomalies in that area. The other lines were from the shallow-water west side of the Vanuatu North and South Aoba Basins, and also gave increased definition of play concepts in those areas.

A proposal for seismic surveys in Iron Bottom, Russel, Big Bay, East Santo and Malekula Basins was completed for the Solomon Islands and Vanuatu. The proposal was submitted to the EC for funding under the Lome IV agreement, but was not given high enough priority by ACP member countries to be funded. The Secretariat is now discussing the possibility of acquiring new seismic data as a multi-donor funded project or as speculative surveys with oil industry seismic contractors.

The Secretariat also investigated the feasibility of stratigraphic drilling to assess reservoirs and hydrocarbon source rocks for the Solomon Islands and Vanuatu. Quotes obtained from drilling contractors show that the costs are prohibitively high.

PETROLEUM DATA MANAGEMENT

A thorough review of previous work on commercial seismic data was conducted for Fiji and recommendations were made for data retrieval. As a result, nearly 1,000 tapes of commercial seismic data were retrieved and stored on behalf of Fiji at the SOPAC Petroleum Data Bank, AGSO in Canberra. Correspondence was also initiated for the retrieval of seismic films and digital tapes for Solomon Islands and Vanuatu.

These data are potentially valuable assets of the relevant member countries and need to be retrieved, compacted and archived.

Following the arrival in October of navigation tapes and subsequent digitising, several suites of track and shotpoint maps were generated for Tonga, Solomon Islands and Vanuatu.

PETROLEUM LEGISLATION

The Secretariat assisted member countries in the development of the hydrocarbons legislation and policy by organising a workshop held in Vanuatu, attended by twenty senior government officials from eight member countries. Funding was provided by CIDA. With the assistance of legal experts from the UNCTC, OIC, CFTC, UNEPOC and the World Bank, the Workshop provided an overview of petroleum legislation and economics and studied the advantages of different systems of licensing agreements with oil companies.

In addition to the Workshop, the Secretariat assisted Fiji with a review of its existing petroleum legislation. A legal expert from the UNCTC provided proposed updates to the Petroleum Act and a new Model Petroleum Agreement. The Secretariat also reviewed draft petroleum legislation and regulations for the Solomon Islands and Vanuatu.

OFFSHORE PROGRAM

SOPAC investigates the mineral potential of offshore areas in the region, promotes known mineralised areas, advises and assists member states on offshore matters, maintains mineral databases, publishes schedules of research vessels planning to work in the region, plans offshore programs approved by member countries, and seeks ship time to carry them out.

The Secretariat has planned and carried out sea-floor mapping surveys and investigated mineral potential, geological hazards, and geological problem areas, lately by GLORIA sidescan and other modern geophysical methods, and provided assistance to member countries by coordinating the work of research vessels operating in the region. SOPAC has been active in the promotion of regional science and its relationship to economic potential through the STAR organisation.

With current foreign marine scientific research at high levels in the region (totalling more than one year of ship time), the emphasis of the Secretariat's work is on coordination activities to ensure that member countries can make maximum use of the high technology ships at minimum cost, participate in the cruises, and obtain the data and information collected in their EEZs.

DEEP-SEA MINERALS

Deep-sea minerals include cobalt-rich crusts, manganese nodules, polymetallic sulphides, metalliferous sediments, and seamount phosphates.

Mineral investigations have centred on areas in Papua New Guinea under the joint Japan-SOPAC deep sea minerals investigation program using the *R/V Hakurei Maru No.2*. A two month cruise in August-October investigated hydrothermal potential in the Bismarck Sea. Papua New Guinea trainees participated on both legs of the cruise, and a SOPAC representative was on the first leg. A preliminary cruise report was received along with bathymetric maps of the complex region west of Manus Basin. Prospective sites for hydrothermal deposits and sediments were located.

SOPAC's manganese nodule database for the region was used by East-West Centre, Hawaii, to evaluate the nodule resources of the Cook Islands and compare them with those of the Clarion-Clipperton zone. A brochure will be prepared to promote the resources to the deep sea mining community.

SEA-BED MAPPING

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.

Hydrosweep multibeam bathymetry collected in Papua New Guinea during the 1992 cruise of the *R/V Hakurei Maru No.2* provided detailed bathymetry of several areas and shoals. Seabeam data collected by the *R/V Discoverer* in the Kiribati and Cook Islands regions was also received by SOPAC. Existing bathymetric data for the EEZs of new SOPAC members Federated States of Micronesia and Marshall Islands have been collected at the Secretariat.

Technical Reports on interpretations of the 1989 GLORIA survey in areas of Vanuatu, Western Samoa, Fiji, Tonga and Solomon Islands were completed, and seven manuscripts on the GLORIA data were prepared for publication in GeoMarine Letters in 1993. A seven sheet preliminary bathymetric map of the Lau Basin at a scale of 1:375,000 (the same scale as existing GLORIA mosaics) was received from the Institute of Oceanographic Sciences Deacon Laboratory (IOSDL) in the United Kingdom. Planning proceeded towards implementing the EC-funded swath mapping survey in 1993, which will include work in Tuvalu, Solomon Islands, Vanuatu and Fiji waters.

TRAINING PROGRAM

Human resources development is an important aspect of SOPAC's Work Program, and includes general education of island member country nationals in the earth sciences as well as technical, scientific, and management training in marine and coastal geology, environmental geology, and non-living resources assessment.

Training activities are grouped into Certificate Courses, Scholarships, Fellowships, and Workshops and Seminars, and Development Advice.

CERTIFICATE COURSES

The Certificate in Earth Science and Marine Geology is an ongoing activity run over a three year period for three months each year. It comprises a Basic Course in year one followed by four six week Advanced Courses in years two and three. The objective of this regional training program is to provide continuing training and development of skills and background knowledge required by technicians in their positions within mineral resource departments throughout the South Pacific. The course is also attended by participants sponsored by mining companies.

Thirteen participants from five member countries attended advanced certificate courses in 1992. All participants successfully passed, and in due course will graduate with the Certificate in Earth Science awarded jointly by the University of the South Pacific and Victoria University of Wellington.

There are now 40 Certificate Graduates, of which ten have gone on to degree studies. In 1993, another 25 students are expected to start.

SCHOLARSHIPS

The SOPAC Scholarship Scheme provides first degree training in geology and engineering for member country nationals. A total of seven scholarships for six member countries were held during 1992 at the Universities of Hawaii, Canterbury, British Columbia, the University of the South Pacific, and Queensland University of Technology.

FELLOWSHIPS

The objective of the SOPAC Fellowship Scheme is to enable individuals to gain technical and scientific on-the-job training for periods of up to three months, either with Secretariat staff or with other appropriate organisations. In 1992, 24 Fellowships were awarded.

Of particular note this past year was the training of individuals at places in the region other than at the Secretariat. The attachments were for periods of up to eight weeks. Large deep sea research vessels regularly coordinate their activities in the region with the SOPAC Work Program. In all cases the opportunity for suitably qualified island member country individuals to participate with the activities at sea is offered. Onboard ship training in 1992 included participation by a representative of Papua New Guinea on a cruise to the Woodlark Basin on the *R/V Ewing*.

Nine representatives from five member countries also received support for attachments to organisations, including

Classes in the field for trainees on the SOPAC Earth Science and Marine Geology Course.

OCEANOR, and attendance at conferences outside the region, including PACON 92, AAPG Meeting and IGC Meeting.

WORKSHOPS AND SEMINARS

Regional Workshops have been held regularly since 1975, providing training opportunities on a specific SOPAC Work Program activity. They give island nationals the opportunity to meet together with experts acknowledged as leaders in their field, to receive theoretical and practical training, to discuss problems of mutual interest, and to obtain expert advice on the development and management of the work program for their country. Two workshops are held annually, one in conjunction with the Annual Session, and the other on Coastal Mapping. Others are held from time to time as the need arises.

The annual Coastal Mapping Workshop was held in the Federated States of Micronesia from 03 - 13 August and was attended by 13 participants from eight member countries. The second SOPAC Coastal Processes Workshop was held prior to the Annual Session in Tonga (see box). The Measurement of Ocean Waves Workshop was held at Secretariat from 17 - 28 February and was attended by 11 participants from five member countries.

The Hydrocarbons Policy Workshop was held in Vanuatu on 13 - 17 July, attended by 20 participants from seven member countries. The Workshop was organised jointly by the Secretariat and OIC, and was funded by CIDA. Using both experts from the region and consultants from the UNCTC, CFTC and Oceans Institute of Canada, the workshop provided an overview of the main issues of petroleum legislation and developing policies for hydrocarbon exploration to assist member countries in the preparation of new petroleum legislation or making updates to existing legislation.

DEVELOPMENT ADVICE

Visits to the Marshall Islands and Federated States of Micronesia were made to begin human resources development advisory assistance. Continued lecturing assistance was given to the University of the South Pacific, particularly in the Ocean Resource Management Program and the Marine Studies Program.

INFORMATION PROGRAM

One of SOPAC's key roles as a regional organisation is the effective dissemination of geoscience data and information to its member countries. The Information Program includes the development and maintenance of library services, both at the Secretariat and in member countries; publication of technical and promotional reports; compilation and publication of bathymetric and coastal maps; and management of data.

CARTOGRAPHY

SOPAC compiles and publishes a range of maps for member countries, including bathymetric maps of EEZs, lagoons and coastlines, coastal resource maps, coastal morphology maps, and sediment maps. Achievements for 1992 are described under Coastal Mapping.

Drafting staff also produce maps and diagrams for SOPAC's technical reports, and training in drafting and map preparation for Pacific island nationals, both at the Secretariat and by instruction at coastal mapping workshops. Preparation of promotional and display material, including poster papers and brochures, is also part of the work.

PUBLICATIONS

The main activity of the Secretariat's publication services is the scientific review, editing, publication and distribution of the results of the Work Program. In 1992, about 65 reports of various categories were edited, published and distributed. All these reports are primarily for SOPAC's member countries and are therefore effectively of restricted circulation.

Technical Bulletins are generally compilations of substantial investigations of a particular type, and make SOPAC's work more widely available than the report series. Other audiences for SOPAC's reports are donors, to demonstrate that their funding support is worthwhile, and the wider scientific community, to continue to attract interest in the region. This particularly effective in developing in-kind support for SOPAC's work.

Publications services also produce public awareness material, which includes the Annual Report, SOPAC News, SOPAC Projects and

promotional brochures. Of these, SOPAC Projects is a key publication, intended to provide easily read summaries of the results of the Work Program to ensure that the information and its applications are available to as wide an audience as possible.

This is a substantial output of this type of material for a small organisation, yet there are concerns of insufficient awareness of SOPAC's work in some areas, including in some member countries.

LIBRARY

The SOPAC library is the principal resource in the region for marine geoscience information. The library provides access to marine geological information for the Secretariat staff, staff of the geological departments in the member countries, researchers with related interests and other users of this kind of information in the Pacific region. The library provides current awareness services, reference services, acquisitions of new books and journals, including material obtained through an expanded gift and exchange program, and inter-library loans (with the assistance of the Pacific Island Marine Resources Information System (PIMRIS), and the School of Ocean and Earth Science and Technology (SOEST) Library, University of Hawaii).

In February 1992, the Papua New Guinea national assistant librarian assumed full responsibility for the library following the departure of the Canadian-funded librarian on expiry of her contract, leaving a well organised specialist library at the Secretariat.

Six library databases are maintained; one each for aerial photographs, journals, maps/charts, monographs/reports/reprints, newspaper clippings, and photographs/slides, with regular current awareness lists generated from each database for in-house circulation.

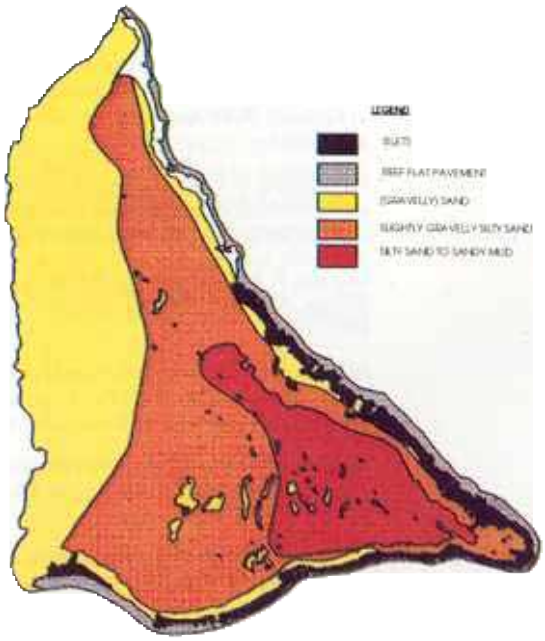
Assistance is also given to member countries with organisation of their geology collections or libraries.

REGIONAL DATA CENTRE

Governments need access to accurate, timely and relevant information and analysis to assist with policy making on the responsible exploitation of their non-living offshore, coastal and onshore resources. The these resources are or have the potential to be a critical factor in the economies of many SOPAC member countries. The Regional Data Centre at the Secretariat provides centralised services to member countries by assisting with acquisition of existing data, and its storage, retrieval and processing. Outputs include navigation, bathymetric, and geophysical maps, interpreted satellite images and aerial photographs, and summary reports of data held. The Centre provides appropriate software and hardware to member countries to enable them to carry out independent analysis of their own data, together with that from the Centre, for management of their resources. The Centre also provides support to other Work Program activities at the Secretariat.

Data acquisition and storage of offshore data continued during 1992, and facilities at the Secretariat were reorganised and up-graded. With assistance from ORSTOM, Noumea, a trial E-Mail link was established to assess its usefulness and cost-effectiveness.

Support for the Data Manager position, established in 1978, concluded in June 1992. In late 1992, the French-funded position of Mapping Geologist and the new position of Computer Systems Manager were filled, which will allow decisions to be made on databases, GIS and other software required to fulfill SOPAC requirements, particularly to improve the provision of information to member countries.



A computer drawn sediment distribution map of Tarawa Lagoon, Kiribati, provides a broad inventory of aggregate resources for coastal management purposes.

APPENDIX 1

SOPAC PUBLICATIONS FOR 1992

COASTAL PROGRAM

Holden, B.; Saphore, E. 1992: Oceanographic and coastal field work, Port Havannah, Mele Bay, Erakor Lagoon, Vanuatu. *SOPAC Preliminary Report 40.*

Gillie, R. 1992: Airphoto survey of coastal areas, Upolu and Savaii, Western Samoa, February 1992. *SOPAC Preliminary Report 43.*

Smith, R.; Prasad, S. 1992: Geophysical survey of Cuvu Harbour sediments, Viti Levu, Fiji. *SOPAC Preliminary Report 44.*

Smith, R.; Saphore, E. 1992: Detailed bathymetric survey of Pilot Dredge Site, Funafuti Atoll, Tuvalu. *SOPAC Preliminary Report 45.*

Smith, R.; Saphore, E. 1992: Geophysics and the Rewa River pipe line. *SOPAC Preliminary Report 46.*

Barstow, S.F. 1992: Preliminary study of wave climatology of the Pacific. *SOPAC Preliminary Report 47.*

Gillie, R.D. 1992: Air photo and coastal surveys, South Tarawa, Kiribati, May 1992. *SOPAC Preliminary Report 48.*

Gillie, R.D.; Prasad, S. 1992: Beach profile surveys, Cuvu Harbour, Viti Levu, Fiji. *SOPAC Preliminary Report 49.*

Gillie, R.D.; Harper, J.R. 1992: Beach profile survey data, 1984 to 1991, Fongafale, Funafuti, Tuvalu. *SOPAC Preliminary Report 50.*

Smith, R. 1992: Geophysical investigations, Forari Bay, Efate, Vanuatu. *SOPAC Preliminary Report 51:* CONFIDENTIAL.

Gillie, R.D. 1992: Reconnaissance survey of coastal erosion sites in the Gilbert Islands group, Republic of Kiribati, 10-19 August 1992. *SOPAC Preliminary Report 52.*

Woodward, P. 1992: Air photo survey of coastal areas, Northern Guadalcanal, Solomon Islands, August 1992. *SOPAC Preliminary Report 53.*

Holden, B. 1992: Coastal protection, Tebunginako Village, Abaiang, Kiribati. *SOPAC Technical Report 136.*

Holden, B. 1992: Circulation and flushing Ngatangiia Harbour and Muri Lagoon, Rarotonga, Cook Islands. *SOPAC Technical Report 142.*

Holden, B. 1992: Ocean currents and circulation, Avarua - Motutoa, Rarotonga, Cook Islands. *SOPAC Technical Report 143.*

Holden, B.J. 1992: Coastal processes and the Rotuma Wharf, Fiji. *SOPAC Technical Report 146.*

Barstow, S.; Patiale, M. 1992: An appraisal of the visual wave observations at Funafuti, 1984-1992. *SOPAC Technical Report 147.*

Holden, B.J. 1992: Coastal damage inspection, 1 December 1990, after Cyclone Sina, 27-28 November 1990. *SOPAC Technical Report 148.*

Holden, B.J. 1992: Mele Bay and Erakor Lagoon, Vanuatu. *SOPAC Technical Report 149.*

Holden, B.J. 1992: Physical oceanography of Port Havannah, Efate, Vanuatu. *SOPAC Technical Report 150.*

Gillie, R.D. 1992: Ranadi Beach coastal erosion study, Honiara, Guadalcanal, Solomon Islands. *SOPAC Technical Report 152.*

Barstow, S.F., Olsen, E. 1992: Wave data collection, Kadavu, Fiji, June 1991-December 1991. *SOPAC Technical Report 153.*

Barstow, S.F., Olsen, E. 1992: Wave data collection, Tongatapu, Kingdom of Tonga, May 1987-December 1991. *SOPAC Technical Report 154.*

Barstow, S.F., Olsen, E. 1992: Wave data collection, Funafuti, Tuvalu, May 1990-December 1991. *SOPAC Technical Report 155.*

Barstow, S.F., Olsen, E. 1992: Wave data collection, Efate, Vanuatu, November 1990-December 1991. *SOPAC Technical Report 156.*

Barstow, S.F., Olsen, E. 1992: Wave data collection, Western Samoa, May 1990-December 1991. *SOPAC Technical Report 157.*

Richmond, B.M. 1992: Notes to accompany coastal map of Rarotonga, Cook Islands. *SOPAC Miscellaneous Report 123.*

Gillie, R.D. 1992: Small format camera operations and applications in the South Pacific. *SOPAC Miscellaneous Report 127.*

Gillie, R.D. 1992: Preliminary coastal morphology maps Tarawa, Kiribati, 1988. *SOPAC Miscellaneous Report 128.*

Gillie, R.D.; Woodward, P. 1992: Air photo survey of coastal areas, Upolu and Savaii, Western Samoa, February 1992. *SOPAC Miscellaneous Report 129.*

Collins, W.T. 1992: Final report for the position of Marine Geologist, Nearshore Minerals Program, June 1990-September 1992. *SOPAC Miscellaneous Report 131.*

Holden, B.J. 1992: Signing off report for the position of Coastal/Oceanographic Engineer, Nearshore Minerals Program, July 1990 - June 1992. *SOPAC Miscellaneous Report 132.*

Smith, R.; Saphore, E. & others 1992: Marine geophysics/geology survey, Port Moresby, Papua New Guinea. *SOPAC Miscellaneous Report 134.*

Gillie, R. 1992: Final report for the position of Coastal Geologist, ICOD Nearshore Minerals Project, 29 May 1990 - 28 November 1992. *SOPAC Miscellaneous Report 135.*

Gillie, R. 1992: Air photo survey of South Tarawa, Kiribati, May 1992. *SOPAC Miscellaneous Report 136.*

HYDROCARBON PROGRAM

Petroleum Potential of Vanuatu, Southwest Pacific (published by BMR with contributions by SOPAC).

Rodd, J.A. 1992: Hydrocarbon source rock analysis of samples from ODP sites 832 and 833, Vanuatu. *SOPAC Technical Report 145.*

DEEPSEA MINERALS AND SEABED MAPPING PROGRAMS

Tiffin, D.L. 1992: SAVANES - diving in Vanuatu by Cyana/Le Noroit, December 1991 - January 1992. *SOPAC Cruise Report 140.*

Johnson, D.; Maillet, P.; Price, R. 1992. The seabed morphology of the Hazel Holme Fracture Zone and the New Hebrides Arc, northern Vanuatu - eastern Solomon Island region. *SOPAC Technical Report 138.*

Price, R.C.; Maillet, P.; Johnson, D.P. 1992: Interpretation of GLORIA sidescan sonar imagery for the Coriolis Troughs and the New Hebrides back-arc. *SOPAC Technical Report 139.*

Jarvis, P.A., Tanahashi, M., Hughes Clarke, J., Kroenke, L., Tiffin, D., 1992: SeaMARC II and GLORIA Sidescan Sonar of the North Fiji Basin Triple Junction. Seismological Society of Japan mtg, Kyoto University, April.

Parson, L.M. and Tiffin, D.L., 1992: The Northern Lau Basin: Diffuse Backarc Extension at the Leading Edge of the Indo-Australian Plate. *SOPAC Technical Report 141.*

Hughes Clarke, J.E., Jarvis, P., Tiffin, D.L., Price, R., and Kroenke, L., 1992: Tectonic Activity and Plate Boundaries Along the Northern Flank of the Fiji Platform. Geo-Marine Letters (submitted).

Kinoshita, Y., and Tiffin, D., 1992: Executive Summary of "Ocean Resources Investigation in the Sea area of SOPAC, Report on the Joint Basic Study for the Development of Resources." Volume 2, Sea Area of the Republic of Kiribati. *SOPAC Technical Report 151.*

Report on a survey for hydrothermal minerals, south of the Admiralty Islands, Papua New Guinea. Preliminary Cruise Report of the Hakurei Maru No.2, 15 August - 18 October 1992 under the Joint Japan-SOPAC Program for Ocean Resources Investigation in the Sea Area of SOPAC. *SOPAC Cruise Report 141.*

TRAINING PROGRAM

George, D. 1992: Library training attachment at Techsec, 20 November - 13 December 1991 (for Serah Douglas, Secretary, Vanuatu Department of Geology, Mines & Rural Water Supply. *SOPAC Training Report 44.*

Howorth, R. 1992: Report on courses for the Certificate in Earth Science and Marine Geology Training Program: 8 April - 28 June 1991. *SOPAC Training Report 45.*

Kitekei'aho, T.; Falnes, Prof. J. 1992: Ocean Wave Measurement Workshop II, 17-28 February 1992. *SOPAC Training Report 46.*

Howorth, R.; Woodward, P. 1992: SOPAC 1992 Coastal Mapping Workshop, Federated States of Micronesia, 4-12 August 1992. *SOPAC Training Report 47.*

Howorth, R. 1992: Phase 2 ICOD Fellowship Scheme. *SOPAC Training Report 48.*

Howorth, R.; Shorten, G. 1992: Report on the Second SOPAC Workshop on Coastal Processes in Island Nations in the South and Central Pacific. *SOPAC Training Report 49.*

Holden, B. (ed.) 1992: Report on the Workshop on Concrete in Tropical Marine Environments of the South Pacific, 28-31 October 1991, Fiji. *SOPAC Miscellaneous Report 121.*

INFORMATION PROGRAM

Creech, H. 1992: Library assistance to the Ministry of Natural Resource Development, Kiribati. *SOPAC Preliminary Report 41.*

Creech, H. 1992: Strengthening library resources for the Mineral Resources Department, Fiji. *SOPAC Preliminary Report 42.*

Creech, H.; George, D. 1992: Strengthening Library Resources at the Department of Geology, Mines and Rural Water Supply, Vanuatu. *SOPAC Technical Report 137.*

Creech, H. 1992: Strengthening information resources at the Solomon Islands Ministry of Natural Resources Geology Division. *SOPAC Technical Report 140.*

George, D. 1992: Library assistance to the Geological Survey of Papua New Guinea Library, 6-10 April 1992. *SOPAC Technical Report 144.*

Creech, H.E.(Comp.) 1991: Pacific Geoscience Directory. *SOPAC Miscellaneous Report 118.*

McDowell, R.; Creech, H. 1991: Information control and the aquatic environment of the South Pacific. *SOPAC Miscellaneous Report 119.*

SOPAC Secretariat, 1992: Operations Manual. *SOPAC Miscellaneous Report 120.*

Creech, H. 1992: South Pacific Applied Geoscience Commission (SOPAC), Library Manual. 2-volume loose-leaf manual kept in the library and updated regularly. *SOPAC Miscellaneous Report 122.*

Creech, H. 1992: SOPAC technical filing system review. *SOPAC Miscellaneous Report 124.*

Creech, H.; Bukarau, L. 1992: Final report to ICOD on Project 870137. *SOPAC Miscellaneous Report 125.*

ANON, 1992: Report on a review and evaluation of the South Pacific Applied Geoscience Commission (SOPAC). *SOPAC Miscellaneous Report 130.*

SOPAC Secretariat, 1992: South Pacific Applied Geoscience Commission Work Program. October 1992-December 1993. *SOPAC Miscellaneous Report 133.*

SOPAC Secretariat 1992: Report on Work Program Activities of the SOPAC Secretariat for 1991/1992. *SOPAC Miscellaneous Report 138.*

George, D. 1992: Library training attachment at Techsec, 20 November - 13 December 1991 (for Serah Douglas, Secretary, Vanuatu Department of Geology, Mines & Rural Water Supply. *SOPAC Training Report 44.*

SOPAC Annual Report Summary 1991.

SOPAC News, Volume 9, Numbers 1, 2 & 3.

SOPAC Projects (2 issues).

Sherwood, Alan & Bukarau, Lala 1992: Proceedings of the Twentieth Session, Port Vila, Vanuatu, 23 September - 2 October 1991.

APPENDIX 2

TECHNICAL SECRETARIAT STAFF LIST

		(Contract end)
MANAGEMENT PROGRAM		
Director	Philipp Muller	January 1995
Deputy Director	Jim Eade	February 1995
Program Coordinator	Teuea Toatu	June 1994
Finance & Administration Controller	Umar Farook	April 1994
Accountant	Angela Pal	February 1995
Administrative Assistant	Nazmeen Whippy	Permanent
Executive Secretary	Jean Brown	Permanent
Senior Technical Secretary	Laisa Baravilala	Permanent
Assistant Accountant	Marica Salusalu	Permanent
Accounts Clerk	Anita Vanua	Temporary
Secretary/Clerk	Annette Olssen	Permanent
Receptionist/Clerk	Unaisi Bainiloga	Permanent
Office Assistant/Cleaner	Salestino Niu Daurewa	Permanent
Driver/Clerk	Enele Gaunavou	Permanent
Watchman/Security	Cama Temo	Permanent
Watchman/Security	Inoke Soqo	Permanent
Watchman/Security	Watisoni Tuberi	Permanent
COASTAL PROGRAM		
Marine Geologist	Robert Smith	July 1995
Marine Geologist	Jackson Lum	October 1995
Coastal Geologist	vacant	November 1992
Coastal Geologist	vacant	
Coastal Engineer	vacant	
Mapping Geologist	Michel Larue	September 1993
Senior Electronics Technician	vacant	
Electronics Technician	Peni Musunamasi	Permanent
Marine Mechanic	Joe Mausio	November 1992
Workshop Assistant	Setareki Ratu	Permanent
Technical Support Assistant	Graeme Frost	April 1995
Senior Geology Technician	Sekove Motuiwaca	Permanent 1994
Technical Secretary	Litia Waradi	December 1994
HYDROCARBON PROGRAM		
Petroleum Coordinator	Jon Rodd	November 1994
Petroleum Geophysicist	Bill Barclay	March 1993
OFFSHORE PROGRAM		
Offshore Geologist	Yasumasa Kinoshita	August 1993
Offshore Coordinator	Don Tiffin	April 1995
Technical Secretary	Lavenia Kamali	December 94
TRAINING PROGRAM		
Training Coordinator	Russell Howorth	July 1995
Assistant Training Coordinator	Fuka Kitekei'aho	November 1994
Technical Secretary	Anna Nata	October 1993
INFORMATION PROGRAM		
Publications Coordinator	Alan Sherwood	April 1995
Assistant Editor	Mereseini Bukarau	September 1994
Librarian	Dillie George	February 1995
Chief Draftsman	Phil Woodward	July 1994
Draftsman	Niko Naibitakele	Permanent
Technical Secretary	Sunita Prasad	December 1994
Computer Systems Manager	Les Allinson	October 1995
Computer Geologist	Antoinne de Biran	January 1993
Computer Operator	Bougainville Bakoso	Permanent
OVERSEAS SUPPORT		
Program Officer (Wave Energy)	Egil Olsen (OCEANOR)	December 1993
Data Manager (Hydrocarbon)	Peter Butler (AGSO)	December 1992

APPENDIX 3

MEETINGS

Management attended the following meetings in 1992:

• Forum Fisheries Agency annual meeting, Niue	Director
• FORUM meetings, Honiara	Director
• ICLARM annual meeting, Manila	Director
• SPOCC annual meeting, Honolulu	Director
• UNDP Fifth Cycle Planning meetings, Suva	Director
• EC-Lome IV discussions, Suva	Director, Deputy Director, Program Coordinator
• International Workshop on DOWA/OTEC, Brussels	Deputy Director
• GEBCO Sub-Commission on Digital Bathymetry, Bidston	Deputy Director
• SOPAC Hydrocarbon Policy Workshop, Vila	Deputy Director
• SOPAC Coastal Seminar, Tarawa	Program Coordinator

APPENDIX 4

1992 BUDGET

SUMMARY OF ANTICIPATED INCOME (INCLUDING IN-KIND SUPPORT CONTRIBUTION) AND EXPENDITURE BY PROGRAMS — REVISED 1992 BUDGET

	F$
Coastal Program	2,534,375
Hydrocarbon and Offshore Programs	1,713,462
Onshore Program	0
Training Program	1,485,302
Information Program	613,199
Management Program	1,345,822
TOTAL	7,692,160

SOPAC MEMBER COUNTRIES