

SOPAC Miscellaneous Report 97

July 1990

SOUTH PACIFIC
APPLIED GEOSCIENCE COMMISSION
REPORT
21st South Pacific Forum Meeting

Port Vila, Vanuatu

July 1990

by

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Director
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Report on the South Pacific Applied Geoscience Commission, SOPAC

General

The Annex to this report provides in summary form general background information on SOPAC.

New Constitution

At their 18th Annual Session, which was held in Canberra in October 1989, the member countries of SOPAC adopted the draft text of an international agreement which is to become the new Constitution of SOPAC. The present Constitution under which SOPAC became an inter-governmental regional organisation in 1984 is in the form of a Memorandum of Understanding. The new agreement, which is expected to be signed by the member countries of SOPAC at their 19th Annual Session, scheduled to be held in Tarawa, Kiribati, in October 1990, is to re-affirm SOPAC's status as an intergovernmental organisation. Under the new agreement, SOPAC will formally adopt the new title South Pacific Applied Geoscience Commission in place of CCOP /SOPAC or Committee for Co-ordination of Joint Prospecting for Mineral Resources in South Pacific Offshore Areas to better reflect the scope of its work programme activities.

In the new Constitution, the member countries of SOPAC will also expressly acknowledge and recognise the important role of the South Pacific Forum in the promotion of regional co-operation in the South Pacific in economic and social development.

Work Programme

The SOPAC Work Programme, which is reviewed and updated at each Annual Session, continues to give priority focus on those programme activities of direct interest and relevance to the development needs and concerns of the SOPAC island member countries.

Nearshore and Coastal Programme

Work has been carried out in Tonga (sand assessment off Nuku'alofa), Vanuatu (sediment budget and coastal environmental surveys in Mele Bay and Havannah Harbour), Tuvalu (sand resource and coastal stability surveys on Funafuti), Western Samoa (review of potential of beach sands for heavy minerals especially gold; mapping of coastal change along Apia foreshore and lagoon following cyclone Of a), and Solomon Islands (analysis of northern Guadalcanal beach samples for gold - continuing).

Global warning and sealevel rise continues to be a high profile topic and be of considerable concern within the region. Techsec has neither the manpower nor resources to contribute significantly to the input of much needed

new information required to establish sound predictions of likely trends. However, Techsec is fulfilling a supporting role by assisting the Australian tide gauge programme and maintaining a watching brief on the results of work reported in scientific literature.

In the aftermath of Cyclone Ofa in Western Samoa in early February, SOPAC was able to respond immediately to a request from Western Samoa to undertake a survey of physical damage caused in the coastal areas of Northern Upolu, together with a follow up coastal engineering and shoreline protection study.

Planning for the lagoon dredging and borrow pit infilling pilot project in Tuvalu is proceeding. It is hoped that dredging can begin in the early part of 1991. The main purpose of the pilot project is to determine the effects dredging will have on the environment.

SOPAC is undertaking a survey in the Cook Islands in July/August to assist in the development of a work plan for harbour development in the Southern Cook Islands.

SOPAC is continuing to monitor sediment movement and changes to beaches along the Nippon Causeway in Tarawa.

Under SOPAC's wave measurement programme, 4 wave rider buoys have been installed in the Cook Islands, Tonga, Western Samoa and Tuvalu. Vanuatu will be the next country to be covered under this programme.

Hydrocarbon Programme

Emphasis has been on the completion of evaluation of hydrocarbon potential in Tonga, Fiji, Solomon Islands and Vanuatu and on the promotion of results. A prospectivity assessment of Tonga has been completed, and glossy brochure to promote and publicise the results will be ready in July.

Similarly, a promotional brochure on the hydrocarbon potential in the Solomon Islands has been completed.

With the assistance of the United Nations Centre on Transnational Corporation, UNCTC, a review of the Solomon Islands' draft petroleum regulations and model agreements and of Vanuatu's draft petroleum legislation has been completed.

Further assistance of UNCTC is being sought in the preparation of draft regulations under the Solomon Islands Mines and Minerals Act.

For Papua New Guinea, assistance by SOPAC has mainly been in the provision of training to PNG nationals in petroleum geology and on mineral exploration.

Offshore Programme

Work is progressing well on the processing and interpretation of results from the 1989 HMAS Cook Gloria survey in Vanuatu, Fiji, Tonga and Western Samoa. This is an outstanding example of joint co-operation to support SOPAC, with Australia providing the HMAS Cook (at a cost of close to \$2 million) and with the European Commission providing funds to cover the hire of the Gloria system and the processing of data.

A SOPAC Consultant, Dr David Cronan, has completed reviews on nodule and crust potential in northern Cook Islands, in the Line and Gilbert Islands in Kiribati, and in Tuvalu.

There has been considerable activity by foreign research vessels in recent months. There have been cruises by:

RV Hakurei Maru NO.2 (Japan) - Southern Line Islands in Kiribati (manganese nodules and cobalt crusts).

RV Sonne (W. Germany) - in Kiribati and Tuvalu (cobalt-rich crusts), Cook Islands (Manihiki Plateau "mud volcanoes"), Fiji and Tonga (Lau Basin hydrothermal minerals), and PNG (hydrothermal mineralisation in Manus Basin).

RV Alexander Nesmeyanov (USSR) in Vanuatu (trench composition and submarine volcanoes), and PNG (volcanic activity. RV Keldysh (USSR) in Tonga (hydrothermal mineralization) and in Papua New Guinea (hydrothermal minerals in West Woodlark Basin).

RV Kaiyo (Japan) - in Fiji (hydrothermal minerals).

RV Moana Wave (USA) - in Solomon Islands (cable route surveys using Seamarc systems).

RV Akademik Selskey (USSR) - Kiribati (multichannel seismic survey - Line Islands).

For most of these cruises, Techsec has assisted with cruise planning, training, and report assessment.

An agreement has been signed for Japan to conduct a new 5 year deepsea mineral assessment cruise programme. Work will cover nodules, crusts, and hydrothermal minerals in Western Samoa, Cook Islands, Kiribati, Solomon Islands, Papua New Guinea, and Vanuatu. Japan will also undertake minerals survey work for Fiji under a bi-lateral arrangement.

Training

The first phase of a new 3-year earth science and marine geology course was completed in March with a record 19 students (Cook Islands 2, Fiji 7

(including 3 from companies), PNG 2, Solomon Islands 3, Tonga 2 and Western Samoa 2).

Under SOPAC's degree scholarships programme, a student each from the Cook Islands, Fiji, Tuvalu, Vanuatu and Western Samoa have begun university degree studies in the earth sciences. Scholarships have also been earmarked this year for a student each from Kiribati, Tonga and the Solomon Islands. PNG will be included in 1991.

On-the-job training at the SOPAC Technical Secretariat has been planned for several technical personnel from member countries, (1 from the Cook Islands, 1 from Kiribati and 3 from the Solomon Islands).

Training has also been provided through training attachment on board ships during cruise surveys in South Pacific waters and through attendance of international scientific and technical symposia of relevance to the member countries.

Training workshops held specifically for participants from SOPAC member countries included a regional workshop on deepsea mineral exploration (onboard the Sonne and in Nuku'alofa, Tonga), a regional workshop on mineral exploration with emphasis on epithermal gold in Wau, PNG, a national workshop on coastal

mapping for physical planners in Honiara, Solomon Islands, and a national workshop on petroleum geology, Port Moresby, PNG.

Information Services

SOPAC has now embarked on the preparation of general summaries of technical reports on mineral resource potential surveys, coastal protection studies and site surveys, and other technical studies, so that member countries can be fully informed on SOPAC work programme results.

An important activity within SOPAC is the preparation and production of morphological and bathymetric maps. Support is also provided to member countries through SOPAC's technical library services and data management programme.

Budget

To support the operation of its Technical Secretariat, including the implementation of its Work Programme, SOPAC has an approved Budget of close to \$10 million in 1990. 3% of this is covered by membership contribution whilst for the remaining 97% SOPAC is dependent on special grants and in-kind contributions by supporting Governments and multi-lateral agencies or programmes.

The SOPAC Technical Secretariat is grateful to donor Governments and organisations in generously supplementing the contributions of the member countries.

Liaison and Reporting

Through visits, attendance at regional meetings and through regular reports, the SOPAC Technical Secretariat has kept in close touch with SOPAC member countries consulting with them and keeping them fully informed on the activities of the Technical Secretariat and on the implementation of the SOPAC Work Programme.

With SOPAC's heavy dependence on aid support, regular contacts have also been maintained with supporting Governments and organisations and especially with the major donors such as Canada, the European Commission, ESCAP/UNDP, CFTC, France, Japan, Norway, the US, the Federal Republic of Germany, etc., as well as with Australia, NZ and Fiji, which are member countries that make special supplementary grants to SOPAC.

Co-operation with other Regional Organisations

As a member of the Forum family of regional organisations and of the South Pacific Organisation's Co-ordinating Committee (SPOCC), SOPAC has maintained close and regular contacts with the Forum Secretariat, the Forum Fisheries Agency, the USP, the South Pacific Commission (including the SPREP

programme), the Pacific Islands Development Programme and other regional programmes to develop and promote joint co-operative efforts and to identify areas of mutual co-operation.

ANNEX

SOUTH PACIFIC

**APPLIED GEOSCIENCE COMMISSION
(SOPAC)**

**SOUTH PACIFIC APPLIED GEOSCIENCE COMMISSION,
SOPAC**

MEMBER COUNTRIES: Australia, Cook Islands, Fiji, Guam, Kiribati, New Zealand, Papua New Guinea, Solomon Islands, Tonga, Tuvalu, Vanuatu, Western Samoa.

1990 BUDGET: F\$9,652,716

CONTRIBUTIONS:	Member countries	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

Major donors are Australia, NZ, Fiji, Canada, EEC, France, Norway, UNDP, CFTC, Japan, West Germany and US. Summary details are given in Attachment 1.

TECHNICAL SECRETARIAT: Suva, Fiji

Current staff establishment and postholders are as follows:

Position	Incumbent	Funding
MANAGEMENT		
1. Director	J Kotobalavu	SOPAC
2. Deputy Director	J. Eade	Australia
3. Finance & Admin. Officer	G. Singh	SOPAC
4. Programme Co-ordinator	Recruiting	EEC
5. Executive Secretary	J. Brown	SOPAC
6. Senior Technical Secretary	L. Baravilala	SOPAC
TECHNICAL PROGRAMMES		
Coastal and Nearshore Programme		
7. Coastal Geologist	D. Rearic	USGS
8. Coastal Geologist	R. Gillie	ICOD
9. Coastal Engineer	B. Holden	CIDA
10. Geologist	A. Komura	Japan
11. Marine Geologist	R. Smith	CFTC
12. Marine Geologist	W. Collins	ICOD
13. Marine Scientist	R. Carter	ESCAP/UNDP
14. Remote Sensing Geologist	Recruiting	France
15. Wave Engineer	E. Olsen	Norway
Hydrocarbon Programme		
16. Petroleum Geologist	H. Johnson	CFTC
17. Petroleum Geophysicist	Recruiting	CIDA
Offshore Programme		
18. Offshore Co-ordinator	D. Tiffin	CIDA
Training Programme		
19. Training Co-ordinator	R. Howorth	ESCAP/UNDP
20. Asst. Training Co-ordinator	Recruiting	EEC

Technical Support Programme**Data Management**

21.	Data Manager	Y. Morel	France
22.	Computer Geologist	A. Dauzat	France
23.	Computer Operator	B. Bakoso	France

Technical Information

24.	Technical Editor	A. Sherwood	NZ
25.	Assistant Editor	L. Bukarau	EEC
26.	Librarian	H. Creech	ICOD
27.	Trainee Librarian	D. George	ICOD/SOPAC
28.	Chief Draftsman	P. Woodward	Australia
29.	Draftsman	N. Naibitakele	ESCAP/UNDP

Technical Services

30.	Electronics Engineer	E. Saphore	ESCAP/UNDP
31.	Snr Electronics Technician	Recruiting	EEC
32.	Electronics Technician	P. Musunamasi	ESCAP/UNDP
33.	Marine Mechanic	J. Mausio	EEC
34.	Snr Geology Technician	S. Motuiwaca	ESCAP/UNDP
35.	Technl Support Assistant	Recruiting	EEC
36.	Workshops Assistant	S. Ratu	SOPAC

Technical Secretaries

37.	Technical Secretary	L. Waradi	EEC
38.	Technical Secretary	L. Kamali	EEC
39.	Technical Secretary	S. Raibosa	EEC
40.	Technical Secretary	S. Prasad	EEC

FINANCE AND ADMINISTRATION SUPPORT

41.	Accountant	K.P. Sharma	SOPAC
42.	Administrative Assistant	N. Whippy	SOPAC
43.	Accounts Clerk	M. Cavalevu	SOPAC
44.	Secretary/Registry Clerk	A. Natia	SOPAC
45.	Receptionist/Clerk	U. Bainiloga	SOPAC
46.	Driver/Clerk	E. Gaunavou	SOPAC
47.	Cleaner/Office Assistant	N. Daurewa	SOPAC
48.	Watchman/Security	T. Cama	SOPAC
		W. Tuberi	SOPAC
		I. Sogo	SOPAC
		on roster basis	

SOPAC WORK PROGRAMME

The basic objectives of the SOPAC Work Programme are to assist its island member countries in

- * providing 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.
- * investigating the resource potential coastal, nearshore and offshore minerals including construction materials, phosphates, cobalt-rich crusts, manganese nodules, polymetallic sulphides precious corals and detital minerals such as gold.
- * assessing and promoting the hydrocarbon and wave energy potential of the region.
- * coordinating marine geological and geophysical research being carried out in the region.
- * curating and distributing marine geological and geophysical data from the South Pacific.
- * training nationals in the implementation and management of their work programmes.

To meet these objectives SOPAC develops at its Annual Session an annual Work List of activities, which when approved by its member nations becomes the operation Work Plan for its Technical Secretariat. The SOPAC Work Plan for 1990 are in [Attachments 2 and 3](#).

CO-ORDINATION & COOPERATION with other REGIONAL AGENCIES:

In its work programme SOP AC interacts in several areas with other regional organisations and programmes but, as highlighted in [Attachment 4](#), there is close consultation and co-ordination to maximise co-operation and avoid duplication.

ATTACHMENTS:

1. 1990 SOP AC Budget Summary
2. SOPAC 1990 Work Plan (Listing by Country)
3. SOPAC 1990 Work Plan (Listing by Activity)
4. Summary of Co-ordination and Cooperation with other South Pacific Regional Agencies. March 1990.

ATTACHMENT I:

1990 SOPAC BUDGET SUMMARY

SUMMARY OF MEMBERSHIP CONTRIBUTIONS
FOR
1990 BY COUNTRY

	1985/1986 July/June US\$	1986 Special Jul/Dec F\$	1987 F\$	1988 F\$	1989 F\$	1990 Proposed F\$
Australia	4000	4800	9750	9750	9750	9750
Cook Islands	4000	4800	9750	9750	9750	9750
Fiji	4000	4800	9750	9750	9750	9750
Guam	4000	4800	9750	9750	9750	9750
Kiribati	3000	3600	7312	7312	7312	7312
New Zealand	4000	4800	9750	9750	9750	9750
Papua New Guinea	4000	4800	9750	9750	9750	9750
Solomon Islands	4000	4800	9750	9750	9750	9750
Tonga	4000	4800	9750	9750	9750	9750
Tuvalu	1000	1200	2438	2438	2438	2438
Vanuatu	4000	4800	9750	9750	9750	9750
Western Samoa	4000	4800	9750	9750	9750	9750
TOTAL	44000	52800	107250	107250	107250	107250

SUMMARY OF GENERAL PURPOSE FUND, SPECIAL PURPOSE FUND
AND IN-KIND CONTRIBUTIONS 1990 BUDGET

Anticipated Source of Funds	General Purpose Fund	Special Purpose Fund	Total	IN-KIND	Grand Total
Member Countries	107250	0	107250	175000	282250
Australia	178121	255389	433510	74850	508360
New Zealand	118238	242042	360280	0	360280
Fiji	64635	108470	173105	0	173105
France	36625	96705	133330	1150000	1283330
France (Ifremer)	0	22225	22225	0	22225
JICA (JAPAN)	8280	0	8280	1008000	1016280
Norway	36020	75000	111020	430640	541660
West Germany	0	0	0	450000	450000
CFTC	5675	60603	66278	200000	266278
ERC	34596	1408068	1442664	0	1442664
CIDA (CANADA)	83545	956870	1040415	0	1040415
ICOD (CANADA)	50580	430110	480690	0	480690
CIDA/ICOD (CANADA) Training	31152	320368	351520	0	351520
UNDP	8070	72640	80710	575605	656315
USGS (USA)	0	0	0	550000	550000
ICOD (CANADA) Technical Inf. Services	9300	70930	80230	23255	103485
ICOD (CANADA) Technical Inf. Services Additional	0	15000	15000	0	15000
Miscellaneous	45280	0	45280	0	45280
Br Fwd from 1989 Member Countries Local Support	63579	0	63579	0	63579
	880946	4134420	5015366	4637350	9652716

SUMMARY OF GENERAL PURPOSE FUND, SPECIAL PURPOSE FUND AND
IN-KIND CONTRIBUTIONS BY EXPENDITURE HEAD OF PROGRAMMES 1990 BUDGET

PROGRAMME HEAD	GENERAL PURPOSE FUND	SPECIAL PURPOSE FUND	TOTAL	IN-KIND	GRAND TOTAL
Head I Executive Management Programme	291423	247182	538605	0	538605
Head II Nearshore Minerals Programme	5000	751370	756370	238000	994370
Head III Coastal Development Programme	10000	394570	404570	660640	1065210
Head IV Hydrocarbon Programme	5000	525850	530850	130000	660850
Head V Mapping Programme	0	555060	555060	645000	1200060
Head VI Offshore Minerals Programme	0	183385	183385	2055000	2238385
Head VII Training Programme	10000	693268	703268	207920	911188
Head VIII Data Management Programme	0	98930	98930	300000	398930
Head IX Technical Information Programme	60115	449685	509800	116105	625905
Head X Technical Support Services Programme	142808	140370	283178	169315	452493
Head XI Finance/Administrative Support Services Programme	93290	0	93290	11370	104660
Head XII Special Support Services Programme	102140	94750	196890	0	196890
Head XIII Office & Property Support Services Programme	161170	0	161170	104000	265170
TOTALS	880946	4134420	5015366	4637350	9652716

**SOPAC
1990 WORK PLAN**

TASKS TO BE IMPLEMENTED DURING 1990

Listing by Country

COOK ISLANDS

Project CK.1: ASSESSMENT OF MANGANESE NODULE POTENTIAL

Task 90.CK.1a: Assist with the evaluation of nodule potential in the Southern Cook Islands.

Techsec will continue to promote cruises to evaluate the manganese nodule potential of the Cook Islands EEZ. If the Japanese programme continues beyond 1989 Techsec will negotiate a cruise in Western Samoa and Cook Islands waters in the 3rd quarter of 1990 on the Hakurei Maru No.2. In the Cook Islands the focus of this cruise could be the area to the west and south of Rarotonga. Information collected by the Sonne cruise to Aitutaki Passage will be incorporated into this study.

Project CK.4: SURVEYS TO ASSIST WITH COASTAL DEVELOPMENT

Task 90.CK.4a: Development of a work plan for harbour development in the Southern Cook Islands,

Avarua and Avatiu harbours and foreshore require upgrading, improvements to Aitutaki Harbour are planned, and there is an urgent need to make Mauke and Mitiaro boat harbours more usable and safer. A harbour engineer with experience in developing and improving small boat harbours in the South Pacific is required to advise the Cook Island Government and develop a work plan for each of the above harbours. The work plan is to take into account the requirements of the Cook Islands Government for development and the capabilities of its departments to carry out work where possible.

Task 90.CK.4b: Avatiu and Avarua coastal development.

Improvements to Avarua and Avatiu harbours, coastal protection works, and establishing a sewer outfall require data on bathymetry, sediment distribution and movement, waves currents and tides, shoreline stability, etc. A low-level airphoto survey should be made and photos interpreted before data is collected in the field. (For details of work requirements see report by ilCA (March, 1987) "Report on Countermeasures against Coastal Hazards by Cyclone in the Cook Islands")

Task 90.CK.4c: Aitutaki harbour development.

The harbour is being dredged and the material used for road fill. The possibility of extensive developments including development of a boat harbour and land reclamation are being considered. A "base line" study of the northwestern corner of Aitutaki Lagoon would assist development planning. The work should include a low-level airphoto survey, and a study of water circulation and currents, bottom topography, sediment processes and budgets, and coastal stability.

Project CK.5: BATHYMETRIC MAPPING

Task 90.CK.5a: Continued production of lagoon and nearshore bathymetric maps.

Work at Techsec continues on Aitutaki 1:200,000, Mangaia nearshore, Pukapuka lagoon, and Suwarrow lagoon bathymetric maps. A colour airphoto set of Suwarrow flown in June/July 1985 by the "Australian Armed Forces" will provide useful information.

Project CK7: ASSESSMENT OF COBALT-RICH CRUST POTENTIAL

Task 90.CK.7a: Assist in the survey for crusts in the Southern Cooks.

If the current Japanese five year nodule and crust programme is extended then when the Hakurei Maru No.2 works in the Southern Cook Islands assessing the nodule potential, opportunities should be taken to dredge the sides of any seamount encountered at depths of 1000-2000 m for crusts.

Project CK8: ASSESSMENT OF WAVE ENERGY POTENTIAL

Task 90.CK.8a: Continued collection of wave data.

Continue to maintain and service the waverider buoy to ensure the collection of the maximum amount of wave data for the windward side of Rarotonga.

Project CK.10: IDENTIFICATION OF SUITABLE CONSTRUCTION MATERIALS

Task 90.CK.I0a: Dredging plan for Ngatangiia harbour.

The lagoon bed in Ngatangiia harbour is considered to be the best source of sand required for construction purposes on Rarotonga. Commercial dredging has been carried out but has been stopped until a dredging plan has been developed which will avoid or minimise adverse effects on the lagoon environment and shoreline. An up-to-date set of low level airphotos exists. An EIA should be considered.

Project CK.II: COASTAL AND NEARSHORE MAPPING

Task 90.CK.IIa: Rarotonga Coastal Map.

Conservation Department with assistance from the Survey Department are correcting and adding new information to the 2 coastal maps of Rarotonga prepared by Techsec. When completed the two maps will be published by SOPAC.

Task 90.CK.IIb: Aitutaki colour satellite image maps.

Techsec to investigate the possibility of publishing in map form processed images and interpretations of those images.

FIJI

Project FJ.I: ASSESSMENT OF HYDROCARBON POTENTIAL OF FIJI

Task 90.FJ.Ia: Seismic interpretation and hydrocarbon prospectivity assessment of the Great Sea Reefs Area.

This study is required to complete the first phase of seismic interpretation (pre-reprocessing) and prospectivity assessments of Fiji. Available exploration data are to be interpreted and summarized in order to identify potential hydrocarbon traps. The results of this study are to be incorporated in *FJI* Task 90.FJ.Ib outlined below.

Task 90.FJ.Ic: Promote the hydrocarbon potential of Fiji at major international conferences.

Promotion of petroleum prospectivity is required at international petroleum-related conferences. Promotional poster material and papers are to be widely presented to maximize the promotional effort in the most cost-effective way. Suitable conferences for this promotion include the Circum-Pacific Energy and Mineral Resources Conference Honolulu 1990, and the first PNG Petroleum Convention, Port Moresby, 1990.

Task 90.FJ.Id: Coordinate a regional hydrocarbon policy seminar for attendance by senior civil servants and senior energy/policy/legislation advisers (June 1990).

Previously recommended changes to Fiji petroleum legislation and taxation are to be discussed and considered within a regional context at a seminar at present scheduled for June 1990 (subject to funds being available). Consideration is to be given to the legislative section of a planned brochure to promote hydrocarbon prospectivity (Task 90.FJ.1b).

Task 90.FJ.Ie: Coordinate evaluation of hydrocarbon source-rocks and reservoir rocks.

Provide guidance and assistance in sampling of rocks (both outcrop and cores), get samples analysed, and evaluate results. Recommend appropriate further work.

Task 90.FJ.If: Palaeontological dating and biofacies analysis of onland samples from sedimentary basins.

Detailed geological mapping by MRD is significantly adding to the knowledge of the evolution of sedimentary basins in Fiji. Palaeontological dating and biofacies analysis is required to complete the geological investigations. Assistance is required to get onland samples analysed and the results evaluated.

Project FJ.6: ASSESSMENT OF ENERGY POTENTIAL FROM MARINE RENEWABLE SOURCES SUCH AS OTEC, WAVES AND LAGOON CURRENTS.

Task 90.FJ.6a: Installation of waverider buoy.

Baseline data is required to assess the potential of wave energy in Fiji. Requirements are site selection, a site survey, and buoy installation.

Task 90.FJ.6b: Assistance for technical editing and publication.

MRD's search for a cheaper source of energy was directed at Ocean Energy in the late 1970's, in particular OTEC. Baseline data for OTEC have been collected around Viti Levu since mid 1980's. Using this baseline data Fiji is to produce a dossier to promote more research into the possibility of establishing a pilot OTEC project in Fiji waters. Techsec assistance is needed for technical editing and publication of the OTEC dossier compiled by R. Holmes.

Project FJ.19: BASELINE STUDIES OF INSHORE AND NEARSHORE AREAS IN FIJI FOR COASTAL DEVELOPMENT PROGRAMMES.

Task 90.FJ.19d: Coordinate and assist coastal studies by overseas institutions.

Work by overseas institutions can help Fiji develop a database - for sound environmental management. A high priority are the Suva Harbour and Laucala Bay inshore and nearshore areas. Studies to develop conceptual and numerical models on sediments budgets and pollutants should be promoted.

Task 90.FJ.19f: Inventory of sand reserves in Suva waters.

Carbonate reserves in the Suva, Laucala Bay, Namuka, Nukuboco areas have been the major source of materials for the whole building industry in Fiji and for export. Recent trends in coastal development projects has placed an increase in demand on known deposits. A geophysical and drilling programme is required to assess quality and quantity of deposits currently being mined and to locate new deposits leading to the establishment of an inventory of total resources remaining in the Suva nearshore area.

Task 90.FJ.19g: Bedrock Miocene structure around Yasawa Islands and the top end of Nacula Island in the Yasawas.

Information on the bedrock structure around the Yasawa Islands is required to assist with the interpretation of recent on land geological mapping in these islands.

Project FJ.21: DATA MANAGEMENT

Task 90.FJ.21a: Computerization of hydrocarbon database

Existing seismic shotpoint maps and interpreted seismic profiles need to be digitised so that data can be processed and maps of structure contours, isopachs, etc. be prepared. MRD will provide a technical assistant. Computing facilities and task supervision are required.

Task 90.FJ.21b: Trackplot index of all swath mapping data in Fiji's EEZ.

Index maps are required showing coverage of bathymetric and image swath information within Fiji's EEZ. Maps should show sufficient detail so that they can be used for planning purposes.

Task 90.FJ.21c: Strengthening Information Services

The Library for the Mineral Resources Department is administered by the Department of Education. Fiji requires the investigation of options for strengthening the Mineral Resources Department information services, in close cooperation with the MRD library staff and the Department of Education.

Task 90.FJ.21d: Technical editing assistance.

Assistance is required with the review, editing, and preparation for publication of the bulletin on the geology of Suva Harbour by Shorten.

Project: TRAINING

Task 90.FJ.Ta: Training of MRD electronic support staff on the maintenance and operation of geophysical survey equipment.

Both group training and on-the-job training at Techsec on the maintenance and operation of marine geophysical equipment is required for MRD technical staff.

Task 90.FJ.Tb: Short term attachments at overseas institutions for MRD electronic staff.

Training of MRD electronic technical staff at appropriate overseas institutions is requested. Short term attachments should be at institutions who use equipment similar to that used by MRD in marine geological and geophysical surveys.

Task 90.FJ.Td: Remote sensing processing

Training is requested on a project basis for Fiji nationals in the use of the microBRIAN image processing system.

Task 90.FJ.Te: Strengthening hydrocarbon manpower at MRD.

Four man weeks of on-the-job training at Techsec is required in petroleum geology and geophysics for a national geologist.

GUAM

Project GM.1: REVIEW OF BASIC GEOLOGICAL AND GEOPHYSICAL DATA

Task 90.GM.1a: Preparation of index of offshore data.

Prepare a list and index map of all geological and geophysical data that has been collected in Guam's EEZ, including identification of type of data collected, quality, and locality of repository.

Project GM.7: BASELINE SURVEYS FOR COASTAL MANAGEMENT

Task 90.GM.7a: Coastal mapping of southern Guam.

The southern coast of Guam (Agat to Pago Bay) is an area of active development. To assist with development planning detailed maps are required showing coastal morphology (beaches, reefs, lagoons, reef flats etc.), surface and subtidal drainage patterns, sedimentation and erosion sites, structures, and effects of man's activities, geologic formations and hazards, and interpret where possible longshore drift and other coastal processes. The maps should be printed at a scale capable of showing sufficient detail for multipurpose planning. Map preparation will require both airphoto interpretation and field observation.

KIRIBATI

Project KI.1: ASSESSMENT OF PHOSPHATE POTENTIAL

Task 90.KI.1a: Assist with assessment or potential or phosphate resource remaining on Banaba.

The Kiribati Government is exploring the possibility of reopening the phosphate mine on Banaba. The government requires a geologist to assist Kiribati and the Banabans assess the potential for further mining. Assistance is required to: 1. assess technical reports produced by the mining company and advise the Kiribati accordingly; 2. assist, as requested, as technical advisor at meetings on the future of phosphate mining.

Project KI.2: ASSESSMENT OF MANGANESE NODULE POTENTIAL

Task 90.KI.2a: Review or work done on 1989 RV Hakurei Maru No.2 cruise.

During August-October 1989 a two-month long cruise studied nodules and crusts in the southern part of the Line Islands. Results from this cruise should reach Techsec mid 1990. A summary of results and conclusions will be required with recommendations for further action.

Project KI.2: BASELINE STUDIES FOR COASTAL DEVELOPMENT PROJECTS

Task 90.KI.4a: Coastal dynamics along the Nippon Causeway.

Continue beach profiling on Betio and Bairiki, and along both sides of the Nippon Causeway, identifying areas of sand depletion and erosion, and areas of sand build-up. Special attention should be given to the accelerated erosion which appears to be occurring just east of the causeway on the ocean shore of Betio.

Task 90.KI.4d: Sediment budget studies or lagoon areas off the islands or North Tarawa.

Planning has started for the construction of causeways in North Tarawa from Tanaea north. Baseline information is required on sand budgets and physical oceanography of the shallower parts of the lagoon along the North Tarawa coast before work on the causeways commences. This information is essential if changes to the lagoon as a result of constructing causeways is to be monitored and understood.

Project KI.5: ASSESSMENT OF COBALT-RICH CRUST POTENTIAL

Task 90.KI.5a: Review or work done on RV Hakurei Maru No.2 cruises.

During August-October 1989 a two-month long cruise studied nodules and crusts in the southern part of the Line Islands. Results from this cruise should reach Techsec mid 1990. A summary of results and conclusions will be required with recommendations for further action.

Project KI.9: COASTAL AND NEARSHORE MAPPING

Task 90.KI.9a: Mapping or bathymetry and sediments in Tarawa lagoon.

Several major development projects in Tarawa are proceeding or planned. Quality of lagoon water is being monitored to assist control pollution, causeways have been built and more are planned, and a major study of lagoon fisheries is being considered. Information is required by these projects on lagoon depths and nature of sediments present. Bathymetric and sediment maps of Tarawa Lagoon will assist these studies and provide useful information for other work, especially development planning.

PAPUA NEW GUINEA

Project PN.7: INVESTIGATION INTO THE HYDROCARBON POTENTIAL OF THE NEW IRELAND BASIN

Task 90.PN.7a: Develop comprehensive exploration plan for New Ireland Basin.

The New Ireland Basin which extends from New Ireland and New Hanover northeast to the top of the Manus Trench slope, has been shown to contain thick sedimentary sequences of Eocene and younger age and possible Miocene reefs. A thick shelfal carbonate sequence occurs onshore – the Miocene Leflet Limestone.

In order to better resolve the geological history, the tectonic style and the petroleum potential of the basin, the major unsolved problems which must be addressed are: whether it contains high quality source rocks, whether the supposed reef come into shallow water, what the thermal gradient is and whether a "bright spot" off New Ireland is a gas/water or gas/oil contact.

In regard to further or future work in the Basin, PNG would like to request the following:

- drilling on New Ireland to test thickness and character at depth of the Miocene Leflet Limestone;
- gas sampling over the "bright spot" and heat flow profiles to establish thermal gradient;
- regional multi-channel seismic as well as detailed multi-channel seismic over "bright spot" and buried reefs in shallow water;
- seismic magnetic and gravity profiling over proposed Tabar-Feni fault zone; and
- aeromagnetic and/or swath mapping along Tabar-Feni fault zone.

Project PN.8: HYDROTHERMAL MINERALS

Task 90.PN.8a: Study of Hydrothermal vents in the Western Woodlark Basin.

The PACLARK Project is a joint Papua New Guinea, Australia, and Canada study of hydrothermal vents in the Western Woodlark Basin. The major aim of the Project is to locate and study mineral deposits forming around active hydrothermal vents. Three cruises have been completed and funding is being sought for the next phase, detailed direct observations using either a submersible or ROV. PNG requires assistance in securing funds for this next phase.

Project PN.14: BATHYMETRIC MAPPING AND GEOLOGICAL HAZARDS ASSESSMENT

Task 90.PN.14a: Mapping of Tavui Caldera.

A submerged caldera, Tavui Caldera, has recently been discovered immediately north of Rabaul. A bathymetric and subbottom geophysical survey is required to confirm its presence, map it in detail, and assess its current state of activity.

Task 90.PN.14b: Heat flow mapping of Rabaul Harbour

BMR (Australia) plan to conduct a three week survey of the Rabaul Harbour to make a heat flow map for the area which will provide a base *level* from which changes in heat flow can be monitored. Objectives are to determine temperature distribution, thermal gradient, and thermal conductivity of nearshore surface sediments primarily in Simpson Harbour. This work will contribute to the work of the Rabaul Volcanological Observatory in their efforts to evaluate volcanics hazards in the Rabaul area. Assistance is required with the survey, planned for May 1990, by providing trisponder navigation equipment and operator.

Project PN.15: DATA MANAGEMENT

Task 90.PN.15a: Management of hydrocarbon data.

The Papua New Guinea Geological Survey continues to require assistance in managing its hydrocarbon data system. It is requested that the service provided by Techsec continue.

Project: **TRAINING**

Task 90.PN.Ta: Special Basic Earth Science Course in PNG.

The three-week course on basic earth science conducted in June 1989 in PNG was a great success. PNG requests that a follow-up three week course be conducted in 1990 and that it focus on specific subjects such as petrology and stratigraphy, or petroleum geology and geophysics, or possibly two separate course on the above topics.

SOLOMON ISLANDS

Project S1.10: ASSESSMENT OF HYDROCARBON POTENTIAL

Task 90.81.10a: Preparation of legal framework for hydrocarbon exploration and exploitation.

Short term consultancies are required to assist formulate petroleum regulations for Solomon Islands' Petro-Act. This work is to be completed as Soon as possible ready for final presentation at the proposed workshop on hydrocarbon development and management policies in pacific island countries for senior government officials in 1990.

Task 90.SI.10b: Assist locate and obtain basic geophysical data collected in Solomon Islands by oil companies.

Basic data to be retrieved include the Pacific Energy and Minerals tapes for the Iron bottom Sound survey.

Task 90.81.10c: MCS and other data reprocessing.

Supervise experimental reprocessing of basic data, if obtained under Task 90.S1.10b above.

Task 90.81.10f: Source-rock, reservoir, and stratigraphic drilling.

Rock samples are required for source-rock, reservoir and stratigraphic studies. A cored borehole on North Guadalcanal is requested and assistance with project coordination, sampling, and sample analysis is required.

Task 90.81.10g: Promotion of hydrocarbon prospects.

Assistance is requested in the promotion of hydrocarbon potential through publication of brochures and attendance at meetings.

Project SI.16: ASSESSMENT OF MINERAL POTENTIAL IN BEACH AND NEARSHORE AREAS

Task 90.81.16a: Review of geochemical data.

Review and catalogue existing geochemical data from Solomon Islands.

Task 90.81.16b: Gold potential at Matepono River mouth.

Carry out further investigations for gold bearing sands at Matepono River mouth and adjacent area following earlier work which shows that this area *could* be promising for placers.

Project SI.17: COASTAL DEVELOPMENT

Task 90.SI.17b: Baseline hydraulic and water quality studies in North Guadalcanal.

A baseline hydraulic and water quality study is required for the area around the mouth of the Matepona River in North Guadalcanal.

Task 90.SI.17c: Reconnaissance water table study along coastline at Auld Township, Malaita.

A survey of the coastal environment at Auki is requested to determine the cause of water table logging problems. The project should include geologic and hydraulic studies of the water table, structure, and rock formations and lead to a recommendation for a solution to the problem.

Task 90.SI.17d: Reconnaissance survey of coastal erosion at Gizo TownShip, Western province.

The coastal based tourist industry of Gizo is dependent on the stability of the coastline. Erosion occurring in the township is a cause of concern *to* the inhabitants and it is suggested that a study of the problem be initiated. Reconnaissance mapping of the coast with reference to morphology, coastal processes, and coastal structures should be completed and the establishment of a series of

beach profiles to collect baseline data be set up. The nearshore environment and ocean/longshore current regime need to be studied also. The study should aim at producing a plan for the protection of the shoreline.

Task 90.s1.17e: Reconnaissance coastal stability survey of KwaJ and Ngongosila, North Malaita.

Kwai and Ngongosila are low-lying sandbar islands situated on the same reef platform. To date no maps of the islands exist. The islands are heavily populated and are experiencing problems with coastal erosion. A study of the coastal processes affecting the islands should be undertaken. The study should include mapping of the island from air photos and ground truth observations. Studies of the coastal processes should include nearshore current studies, sediment budget studies, and beach profiling to establish baseline data leading to a solution for coastal protection structures.

Task 90.SI.17f: Detailed study of sand and gravel extraction at Ranadi Beach, Honiara.

Sand and gravel have been extracted from Ranadi Beach, Honiara on Guadalcanal since about 1980. At present there are no regulations governing the extraction. This stretch of coastline forms an area of prime industrial and commercial development property and as such the effects of the extraction on the coastline are of great importance. A survey on the extraction and natural recovery rate of the beach should be undertaken. Since 1981, 3 beach profiles have been monitored by the Lands Department and in 1985, 5 more profiles were added. The data from the surveys of the beach profiles should be compiled and plotted and the volume of eroded or accumulated sediment at the sites determined. The material input to the nearshore environment by the Lungga River to the east should also be determined as this is probably a primary component of the beach sediment. Longshore current studies and the effects of storms, particularly cyclones, should be determined. A sedimentary budget and the effects of the gravel extraction can be determined from the above data and a decision on regulation of gravel extraction can be made from this report.

Project SI.22: **DATA MANAGEMENT**

Task 90.SI.22a: Provision of in-country computing facilities.

(training) Supply an IBM PC computer, peripherals, software and assist with its installation and usage

Task 90.s1.22b: Strengthening Information Services.

The Ministry of Natural Resources administers a small library which has been in existence for some years. The Geological Survey Division library is part of this collection. A technical records unit, with reports, maps and photographs exists alongside of the library. Current staffing consists of one person with some drafting training plus a clerk. The Solomon Islands requires assistance in strengthening information services for the Geological Survey Division in cooperation with current library staff, by assessing the present organisation and content of the library and technical records unit in order to recommend directions for development.

Project SI.23: **COASTAL MAPPING**

Task 90.SI.23a: Continue SPOT pilot project on North Guadalcanal coastal and nearshore areas.

SPOT satellite imagery of northern Guadalcanal has been used to map the coastal and nearshore areas and should continue to be used in this area for specific purpose studies. Projects which will benefit from the use of the imagery include mapping of shallow-water and emerged reefs, study of sediment plumes to determine coastal currents, monitoring of coastal erosion and coastal morphology by comparing air photos and recent satellite imagery, comparison of information from computer scanned 1986 air photos and satellite imagery, and creation of a thematic map of all coastal morphologic features and changes.

TONGA

Project TG.4: **HYDROTHERMAL MINERALS**

Task 90.TG.4a: Synthesis and publication of geological and geophysical work in the Lau Basin.

There have been a series of very successful cruises recently in the Lau Basin, including seabed mapping in the northern Lau Basin using Gloria. Full analysis and publication of all the accumulated data is requested.

Project TG.5: **HYDROCARBON POTENTIAL**

Task 90.TG.5a: Promotion of Tonga hydrocarbon potential.

Promotion of the results of hydrocarbon potential studies recently completed are required. The Lands and Survey Department, Tonga, requires assistance in preparing and publishing a promotion package for presentation to oil companies. Techsec is also requested to assist further by data presentations at international conferences.

Task 90.TG.5b: Magnetic survey of Ha'apai and Nomuka Groups.

A recent magnetometer survey was conducted in the island groups of Ha'apai and Nomuka to determine which, if any, of these islands have cores of volcanic material. Interpretation and publication of this data is requested.

Project TG.6: **NEARSHORE MINERALS**

Task 90.TG.6a: Sampling and assessment of sand deposits off Fafa, Nuku'alofa.

The airlift sand sampling survey should be completed and a final assessment of the offshore sand reserves of the Nuku'alofa area compiled into one final report and map or maps as soon as possible.

Project TG.7: **RENEWABLE ENERGY**

Task 90.TG.7a: Continued collection of wave data.

Continued collection of wave data off the SE coast of Tongatapu is required. The waverider buoy should be kept operating with minimal interruptions and the maintenance programme upgraded to ensure this.

Project TG.8: **BASELINE STUDY OF INSHORE AREAS FOR COASTAL DEVELOPMENT PROGRAMMES**

Task 90.TG.8a: Identification and measurement of currents in waters off Nuku'alofa and Northern Tongatapu.

Relevant for future coastal engineering works, eg. new harbour/wharf Sopo end, construction/rehabilitation of beaches, causeways to Oneata and Manima islands, causeway across the mouth of the lagoon.

Project TG.12: **COASTAL AND NEARSHORE MAPPING**

Task 90.TG.12a: SPOT image analyses for Vava'u and Haapai

Purposes for Vava'u - planned causeways, measuring effects of existing causeways, identification of sand deposits, planned reclamation Neiafu Tahi, hotel developments and development of tourist recreation areas.

Purposes for Haapai (Lifuka, 'Uoleva, 'Uiha, Ha'ano)- main group. Proposed new harbour and wharf development, Lifuka, proposed causeways to Ha'ano and 'Uolèva.

TUVALU

Project TU.1: ASSESSMENT OF PRECIOUS CORAL POTENTIAL

Task 90.TU.1b: Reconnaissance survey for Corallium in southernmost waters of Tuvalu.

Reconnaissance dredgings and echosoundings should be made of the seamounts in that part of the Northern Melanesian Borderland which lies in Tuvalu waters. In preparation for this all available depth information should be compiled and a detailed bathymetric map be prepared.

Project TU.2: AGGREGATE MATERIALS FOR CONSTRUCTION AND LANDFILL

Task 90.TU.2a: Lagoon dredging and borrow pit infilling pilot project.

Set up and carry out dredging programme in the lagoon off Fongafale to fill a small borrow pit or part of a larger one. Dredging is to start at the end of the westerly season about April or May and continue for 4 to 6 months. Materials dredged are to be sampled regularly for grade and composition. Efficiency and effectiveness of the dredging operation is to be closely monitored.

Task 90.TU.2b: Assessment of Funafuti lagoon sediments to be used in borrow pit filling.

A small scale suction dredging operation will be carried out to test the feasibility of infilling the borrow pits on Fongafale. Surveys are to be carried out on the lagoon sediments and seabed prior to dredging to determine the quantity, quality, and grade of the fill material for the borrow pit project. Sediment samples should be collected from the lagoon sands and analysed for sorting and grain size characteristics. Surveys are to be carried out to establish the bottom and subbottom characteristics of the lagoon. Bathymetry and sediment distribution maps are also to be completed. This information is required to assist with the setting up of the dredging operation and for planning of the main dredging project once the pilot project is finished.

Project TU.3: NEARSHORE BASELINE STUDIES TO ASSIST WITH COASTAL MANAGEMENT

Task 90.TU.3a: Monitoring the effects of lagoon dredging on beach and nearshore sediment regime.

Beach profiles were established in 1984 on the lagoon side of Fongafale to monitor coastal erosion. These profiles have been resurveyed each year and in 1989 a programme to survey them at 2 month intervals was begun. The surveying of the profiles should continue at 2 month intervals before, during and after the dredging of the fill for the borrow pit project. Compilation and plotting of the data and calculation of erosion and accumulation volumes should be determined at each site to assess the impact, if any, on the coastal environment. Diving operations should be carried out off the beach to set up monitoring stakes near the boundaries of the sand resource to assess the effects of dredging on the movement and redistribution of sand in the lagoon.

Task 90.TU.3b: Study of the biology of Funafuti lagoon and ecology of the lagoon reef.

Surveys are to be carried out on the effects of dredging on the fisheries and reef environment during the borrow pit filling pilot project. The survey should include population and location of fish and should be assessed using input from local fisherman as well as diving traverses by qualified marine biologists. Samples of fish should be taken before and after the dredging and analyzed for the presence of *G. toxicus* (the dinoflagellate that causes ciguatera poisoning).

Task 90.TU.3d: Current and sediment transport study on the effects of a proposed slipway on Fongafale.

A study of the currents and sediment regime should be initiated in the area of the fisheries complex at Funafuti in response to the proposed construction of a 36 metre slipway. The slipway is to be a solid structure and its effect on the coastal environment must first be assessed. Concern has been expressed that the construction of the slipway might alter current flow in the area and result in either sediment accumulation or scouring around the adjacent container wharf.

Project TU.6: **POTENTIAL OF OCEAN ENERGY**

Task 90.TU.6b: Collection of wave data to assess potential of wave energy.

What is the potential of wave energy at Funafuti? To get the data required to answer this question a waverider buoy needs to be installed at a suitable site. Site selection should proceed so that when a buoy is available installation and data collection can proceed.

Project TU.8: **BATHYMETRIC MAPPING**

Task 90.TU.8a: Mapping of Funafuti Lagoon.

Compile all information to date and prepare a bathymetric map of Funafuti Lagoon. Data acquired from the survey of Funafuti Lagoon with respect to the borrow pit filling pilot project should be incorporated into the map.

Task 90.TU.8b: Bathymetric mapping of seamounts in Tuvaluan area of Northern Melanesian Borderland.

A compilation of existing information held at Techsec to be made and a "first draft" contour map prepared. Reconnaissance bathymetric surveys of seamounts in the Northern Melanesian Borderland in southern Tuvalu waters to be conducted as ships of opportunity become available. Mapping is to be conducted in conjunction with reconnaissance surveys for Corallium and cobalt rich-crusts.

VANUATU

Project VA2: INVESTIGATE THE HYDROCARBON POTENTIAL OF VANUATU.

Task 90.VA.2a: Source-rock studies in association with ODP programme.

Support and collaborate with the ODP work scheduled for 1990 with a particular view to obtaining and analysing potential source rock samples.

Task 90.VA.2b: Reinterpretation of existing MCS data.

Existing multichannel seismic data needs to be obtained from the agencies which collected them and where appropriate have them reprocessed and reinterpreted. This work should lead to a reassessment of the hydrocarbon potential of Vanuatu.

Task 90.VA.2c: Promotion of Vanuatu hydrocarbon potential.

Recent work (Tripartite Cruise Programme) has produced an assessment of hydrocarbon potential of Vanuatu. A glossy publication aimed at interesting oil companies in taking out prospecting licences in Vanuatu waters is required. Assistance is also required in circulating copies of this publication to oil companies.

Project VA6: BASELINE STUDIES FOR COASTAL DEVELOPMENT PROGRAMMES

Task 90.VA.6a: Physical oceanographic and sediment baseline study of Havanah Harbour.

Havanah Harbour is a very sheltered inlet which is a tourist attraction where further development is planned. Before development produces too many changes to the environment baseline studies should be made.

Task 90.VA.6b: Coastal stability and sediment budget study of Mele Bay.

Coastal erosion is occurring in the same area in Mele Bay where sand has been mined. A study is required to establish the beach and nearshore sediment budget system and prepare a coastal management plan for the area.

PROJECT VA.7: DATA MANAGEMENT

Task 90.VA.7a: Computer support.

Assist with expanding in-country computing facilities by providing IBM PC-AT computer and basis software set to aid in-country SOP AC work activities.

PROJECT VA8: EXTENSION OF GEOLOGICAL MAP OF VANUATU INTO OFFSHORE AREAS

Task 90.VA.8a: Publication of geological map of Vanuatu region.

This is a joint USGS-Vanuatu project. By 1987 it was reported that the northern and central parts of the 1:1,000,000 map were complete and compilation of the southern part was being carried out in association with ORSTOM. A preliminary rough draft of the map has been prepared. It is requested that the map be completed and published.

PROJECT VA.12: COASTAL AND NEARSHORE MAPPING

Task 90.VA.12a: Coastal maps of parts of Efate.

Coastal maps of parts of Efate have been prepared from data collected during the 1983 SOPAC-USGS Coastal Mapping Workshop. Publication of these maps is requested.

PROJECT VA.13: OCEAN ENERGY

Task 90.VA.13a: Wave energy data collection.

A wayerider buoy should be available for a measurement in Vanuatu in the near future. In preparation for its installation a site needs to be selected and surveyed.

WESTERN SAMOA

Project WS.7: ASSESSMENT OF COBALT-RICH CRUST POTENTIAL.

Task 90.WS.7a: Survey of new cobalt-rich crust sites identified from new data.

If the extension to the Japanese Deepsea Mineral Resource Programme is approved then assistance is required to coordinate and assist with planning of the 1990 cruise of the Hakurei Maru, No.2.

Project WS.9: DATA MANAGEMENT

Task 90.WS.9a: Assistance in the use of GIS

Western Samoa has recently received a Geographic Information System (GIS). Assistance and detailed advice in its use in coastal and nearshore activities is required, particularly those activities of direct relevance to the SOPAC Work Programme.

Task 90.WS.9b: Improvement of library facilities at Apia Observatory.

It is requested that assistance be provided to advise Apia Observatory on ways of improving and upgrading its library facilities, and to assist in making these improvements.

Project WS.11: COASTAL AND NEARSHORE MAPPING

Task 90.WS.11a: Nearshore detailed bathymetric mapping.

Prepare a set of maps for both Upolu and Savai'i showing detailed nearshore bathymetry for the depth interval 0-500 m. The depth interval around 150-250 m is of particular interest to fisheries for their deepwater fisheries research and development programme.

Task 90.WS.11b: Detailed bathymetric mapping of offshore banks.

Compile and prepare detailed bathymetric mapping of banks near Pasco Bank, especially for depths 0-500 m.

Task 90.WS.11c: Development of a mapping work plan.

Techsec have assisted Apia Observatory set up a drawing office so that the Observatory can take advantage of training received by their staff at Techsec on bathymetric and other map production. For the office to become operational assistance in developing a detailed work plan is required.

Project WS.13: GEOLOGICAL HAZARD STUDIES

Task 90.WS.13a: Baseline study of Mulinu'u Peninsula for management of coastal erosion.

Mulinu'u Peninsula, the site of several buildings and places of national importance (including the parliament building), is under threat from coastal erosion. The peninsula appears to have formed when sediment from nearby rivers reached the coast and were carried along the beach and out into the lagoon to form a spit. Through time the shape of the peninsula has probably been changing constantly. Modern developments appear to have changed the sediment supply system and probably the energy system driving the sediments. A baseline study is requested to establish sediment budget system and physical system controlling sediment distribution. The study is to develop a management plan to stabilise the coastline of the peninsula.

Project WS.15: EVALUATION OF DETRITAL MINERAL POTENTIAL IN COASTAL AREAS (New

Task 90.WS.ISa: Review of detrital mineral potential at the coast and in coastal streams.

A review is requested of work done on detrital minerals in surface sediments of streams to assess the results of work done by an Australian firm and to determine whether any aspect of this work should be pursued further.

SOPAC
1990 WORK PLAN

TASKS TO BE IMPLEMENTED DURING 1990

Listing by Activity

COASTAL & NEARSHORE PROGRAMME

Nearshore Minerals

COOK ISLANDS

Task 90.CK.10a: Dredging plan for Ngatangiia harbour.

The lagoon bed in Ngatangiia harbour is considered to be the best source of sand required for construction purposes on Rarotonga. Commercial dredging has been carried out but has been stopped until a dredging plan has been developed which will avoid or minimise adverse effects on the lagoon environment and shoreline. An up-to-date set of low level airphotos exists. An EIA should be considered.

KIRIBATI

Task 90.KI.1a: Assist with assessment of potential of phosphate resource remaining on Banaba.

The Kiribati Government is exploring the possibility of reopening the phosphate mine on Banaba. The government requires a geologist to assist Kiribati and the Banabans assess the potential for further mining. Assistance is required to: 1. assess technical reports produced by the mining company and advise the Kiribati accordingly; 2. assist, as requested, as technical advisor at meetings on the future of phosphate mining.

SOLOMON ISLANDS

Task 90.SI.16a: Review of geochemical data.

Review and catalogue existing geochemical data from Solomon Islands.

Task 90.SI.16b: Gold potential at Matepono River mouth.

Carry out further investigations for gold bearing sands at Matepono River mouth and adjacent area following earlier work which shows that this area could be promising for placers.

Task 90.SI.17f: Detailed study of sand and gravel extraction at Ranadi Beach, Honiara.

Sand and gravel have been extracted from Ranadi Beach, Honiara on Guadalcanal since about 1980. At present there are no regulations governing the extraction. A survey on the extraction and natural recovery rate of the beach should be undertaken. Since 1981, 3 beach profiles have been monitored by the Lands Department and in 1985, 5 more profiles were added. The data from the surveys of the beach profiles should be compiled and plotted and the volume of eroded or accumulated sediment at the sites determined. The material input to the nearshore environment by the Lungga River to the east should also be determined as this is probably a primary component of the beach sediment. Longshore current studies and the effects of storms, particularly cyclones, should be determined. A sedimentary budget and the effects of the gravel extraction can be determined from the above data and a decision on regulation of gravel extraction can be made from this report.

TONGA

Task 90.TG.6a: Sampling and assessment of sand deposits of Fafa, Nuku'alofa.

The airlift sand sampling survey should be completed and a final assessment of the offshore sand reserves of the Nuku'alofa area compiled into one final report and map or maps as soon as possible.

TUVALU

Task 90.TU.1b: Reconnaissance survey for Corallium in southernmost waters of Tuvalu.

Reconnaissance dredgings and echosoundings should be made of the seamounts in that part of the Northern Melanesian Borderland which lies in Tuvalu waters. In preparation for this all available depth information should be compiled and a detailed bathymetric map be prepared.

Task 90.TU.2a: Lagoon dredging and borrow pit infilling pilot project.

Set up and carry out dredging programme in the lagoon off Fongafale to fill a small borrow pit or part of a larger one. Dredging is to start at the end of the westerly season about April or May and continue for 4 to 6 months. Materials dredged are to be sampled regularly for grade and composition. Efficiency and effectiveness of the dredging operation is to be closely monitored.

Task 90.TU.2b: Assessment of Funafuti lagoon sediments to be used in borrow pit filling.

A small scale suction dredging operation will be carried out to test the feasibility of infilling the borrow pits on Fongafale. Surveys are to be carried out on the lagoon sediments and seabed prior to dredging to determine the quantity, quality, and grade of the fill material for the borrow pit project. Sediment samples should be collected from the lagoon sands and analysed for sorting and grain size characteristics. Surveys are to be carried out to establish the bottom and subbottom characteristics of the lagoon. Bathymetry and sediment distribution maps are also to be completed. This information is required to assist with the setting up of the dredging operation and for planning of the main dredging project once the pilot project is finished.

WESTERN SAMOA

Task 90.WS.15a: Review of detrital mineral potential at the coast and in coastal streams.

A review is requested of work done on detrital minerals in surface sediments of streams to assess the results of work done by an Australian firm and to determine whether any aspect of this work should be pursued further.

Coastal Development

COOK ISLANDS

Task 90.CK.4a: Development of a work plan for harbour development in the Southern Cook Islands.

Avarua and Avatiu harbours and foreshore require upgrading, improvements to Aitutaki Harbour are planned, and there is an urgent need to make Mauke and Mitiaro boat harbours more usable and safer. A harbour engineer with experience in developing and improving small boat harbours in the South Pacific is required to advise the Cook Island Government and develop a work plan for each of the above harbours. The work plan is to take into account the requirements of the Cook Islands Government for development and the capabilities of its departments to carry out work where possible.

Task 90.CK.4b: Avatiu and Avarua coastal development.

Improvements to Avarua and Avatiu harbours, coastal protection works, and establishing a sewer outfall require data on bathymetry, sediment distribution and movement, waves currents and tides, shoreline stability, etc. A low-level airphoto survey should be made and photos interpreted before data is collected in the field. (For details of work requirements see report by RCA (March, 1987) "Report on Countermeasures against Coastal Hazards by Cyclone in the Cook Islands")

Task 90.CK.4c: Aitutaki harbour development.

The harbour is being dredged and the material used for road fill. The possibility of extensive developments including development of a boat harbour and land reclamation are being considered. A "base line" study of the northwestern corner of Aitutaki Lagoon would assist development planning. The work should include a low-level airphoto survey, and a study of water circulation and currents, bottom topography, sediment processes and budgets, and coastal stability.

FIJI

Task 90.FJ.19d: Coordinate and assist coastal studies by overseas institutions.

Work by overseas institutions can help Fiji develop a database for sound environmental management. A high priority are the Suva Harbour and Laucala Bay inshore and nearshore areas. Studies to develop conceptual and numerical models on sediments budgets and pollutants should be promoted.

Task 90.FJ.19f: Inventory of sand reserves in Suva waters.

Carbonate reserves in the Suva, Laucala Bay, Namuka, Nukuboco areas have been the major source of materials for the whole building industry in Fiji and for export. Recent trends in coastal development projects has placed an increase in demand on known deposits. A geophysical and drilling programme is required to assess quality and quantity of deposits currently being mined and to locate new deposits leading to the establishment of an inventory of total resources remaining in the Suva nearshore area.

Task 90.FJ.19g: Bedrock Miocene structure around Yasawa Islands and the top end of Nacula island in the Yasawas.

Information on the bedrock structure around the Yasawa Islands is required to assist with the interpretation of recent onland geological mapping in these islands.

KIRIBATI

Task 90.K1.4a: Coastal dynamics along the Nippon Causeway.

Continue beach profiling on Betio and Bairiki, and along both sides of the Nippon Causeway, identifying areas of sand depletion and erosion and areas of sand build-up. Special attention should be given to the accelerated erosion which appears to be occurring just east of the causeway on the ocean shore of Betio.

Task 90.K1.4d: Sediment budget studies of lagoon areas off the islands of North Tarawa.

Planning has started for the construction of causeways in North Tarawa from Tanaea north. Baseline information is required on sand budgets and physical oceanography of the shallower parts of the lagoon along the North Tarawa coast before work on the causeways commences. This information is essential if changes to the lagoon as a result of constructing causeways is to be monitored and understood.

SOLOMON ISLANDS

Task 90.SI.17b: Baseline hydraulic and water quality studies in North Guadalcanal.

A baseline hydraulic and water quality study is required for the area around the mouth of the Matepona River in North Guadalcanal.

Task 90.SI.17c: Reconnaissance water table study along coastline at Auki TownShip, Malaita.

Logging A survey of the coastal environment at Auki is requested to determine the cause of water table problems. The project should include geologic and hydraulic studies of the water table, structure, and rock formations and lead to a recommendation for a solution to the problem.

Task 90.SI.7d: Reconnaissance survey of coastal erosion at Gizo Township, Western province.

The coastal based tourist industry of Gizo is dependent on the stability of the coastline. Erosion occurring in the township is a cause of concern to the inhabitants and it is suggested that a study of the problem be initiated. Reconnaissance mapping of the coast with reference to morphology, coastal processes, and coastal structures should be completed and the establishment of a series of beach profiles to collect baseline data be set up. The nearshore environment and ocean/longshore current regime need to be studied also. The study should aim at producing a plan for the protection of the shoreline.

Task 90.SI.17e: Reconnaissance coastal stability surveyor Kwai and Ngongosila, North Malaita.

Kwai and Ngongosila are low-lying sandbar islands situated on the same reef platform. To date no maps of the islands exist. The islands are heavily populated and are experiencing problems with coastal erosion. A study of the coastal processes affecting the islands should be undertaken. The study should include mapping of the island from air photos and ground truth observations. Studies of the coastal processes should include nearshore current studies, sediment budget studies, and beach profiling to establish baseline data leading to a solution for coastal protection structures.

TONGA

Task 90.TG.8a: Identification and measurement of currents in waters off Nuku'alofa and Northern Tongatapu.

Relevant for future coastal engineering works, e.g. new harbour/wharf Sopu end, construction/rehabilitation of beaches, causeways to Oneata and Manima islands, causeway across the mouth of the lagoon.

TUVALU

Task 90.TU.3a: Monitoring the effects of lagoon dredging on beach and nearshore sediment regime.

Beach profiles were established in 1984 on the lagoon side of Fongafale to monitor coastal erosion. These profiles have been resurveyed each year and in 1989 a programme to survey them at 2 month intervals was begun. The surveying of the profiles should continue at 2 month intervals before, during, and after the dredging of the fill for the borrow pit project. Compilation and plotting of the data and calculation of erosion and accumulation volumes should be determined at each site to assess the impact, if any, on the coastal environment. Diving operations should be carried out off the beach to set up monitoring stakes near the boundaries of the sand resource to assess the effects of dredging on the movement and redistribution of sand in the lagoon.

Task 90.TU.3b: Study of the biology of Funafuti lagoon and ecology of the lagoon reef.

Surveys are to be carried out on the effects of dredging on the fisheries and reef environment during the borrow pit filling pilot project. The survey should include population and location of fish and should be assessed using input from local fisherman as well as diving traverses by qualified marine biologists. Samples of fish should be taken before and after the dredging and analyzed for the presence of G..toxicus (the dinoflagellate that causes ciguatera poisoning).

Task 90.TU.3d: Current and sediment transport study on the effects of a proposed slipway on Fongafale.

A study of the currents and sediment regime should be initiated in the area of the fisheries complex at Funafuti in response to the proposed construction of a 36 metre slipway. The slipway is to be a solid structure and its effect on the coastal environment must first be assessed. Concern has been expressed that the construction of the slipway might alter current flow in the area and result in either sediment accumulation or scouring around the adjacent container wharf.

VANUATU

Task 90.VA.6a: Physical oceanographic and sediment baseline study of Havanah Harbour.

Havanah Harbour is a very sheltered inlet which is a tourist attraction where further development is planned. Before development produces too many changes to the environment baseline studies should be made.

Task 90.VA.6b: Coastal stability and sediment budget study of Mele Bay.

Coastal erosion is occurring in the same area in Mele Bay where sand has been mined. A study is required to establish the beach and nearshore sediment budget system and prepare a coastal management plan for the area.

WESTERN SAMOA

Task 90.WS.13a: Baseline study of Mulinu'u Peninsula for management of coastal erosion.

Mulinu'u Peninsula, the site of several buildings and places of national importance (including the parliament building), is under threat from coastal erosion. The peninsula appears to have formed when sediment from nearby rivers reached the coast and were carried along the beach and out into the lagoon to form a spit. Through time the shape of the peninsula has probably been changing constantly. Modern developments appear to have changed the sediment supply system and probably the energy system driving the sediments. A baseline study is requested to establish sediment budget system and physical system controlling sediment distribution. The study is to develop a management plan to stabilize the coastline of the peninsula.

Coastal and Nearshore Mapping

GUAM

Task 90.GM.7a: Coastal mapping of southern Guam.

The southern coast of Guam (Agat to Pago Bay) is an area of active development. To assist with development planning detailed maps are required showing coastal morphology (beaches, reefs, lagoons, reef flats etc.), surface and subtidal drainage patterns, sedimentation and erosion sites, structures, and effects of man's activities, geologic formations and hazards, and interpret where possible longshore drift and other coastal processes. The maps should be printed at a scale capable of showing sufficient detail for multipurpose planning. Map preparation will require both airphoto interpretation and field observation.

KIRIBATI

Task 90.10.9a: Mapping of bathymetry and sediments in Tarawa lagoon.

Several major development projects in Tarawa are proceeding or planned. Quality of lagoon water is being monitored to assist control pollution, causeways have been built and more are planned, and a major study of lagoon fisheries is being considered. Information is required by these projects on lagoon depths and nature of sediments present. Bathymetric and sediment maps of Tarawa Lagoon will assist these studies and provide useful information for other work, especially development planning.

SOLOMON ISLANDS

Task 90.81.23a: Continue SPOT pilot project on North Guadalcanal coastal and nearshore areas.

SPOT satellite imagery of northern Guadalcanal has been used to map the coastal and nearshore areas and should continue to be used in this area for specific purpose studies. Projects which will benefit from the use of the imagery include mapping of shallow-water and emerged reefs, study of sediment plumes to determine coastal currents, monitoring of coastal erosion and coastal morphology by comparing air photos and recent satellite imagery, comparison of information from computer scanned 1986 air photos and satellite imagery, and creation of a thematic map of all coastal morphologic features and changes.

TONGA

Task 90.TG.Ua: SPOT image analyses for Vava'u and Haapai

Purposes for Vava'u - planned causeways, measuring effects of existing causeways, identification of sand deposits, planned reclamation Neiafu Tam, hotel developments and development of tourist recreation areas.

Purposes for Haapai (Lifuka, 'Uoleva, 'Uilia, Ha'ano) - main group. Proposed new harbour and wharf development, Lifuka, proposed causeways to Ha'ano and 'Uoleva.

Ocean Energy

COOK ISLANDS

Task 90.CK.8a: Continued collection of wave data.

Continue to maintain and service the waverider buoy to ensure the collection of the maximum amount of wave data for the windward side of Rarotonga.

FIJI

Task 90.FJ.6a: Installation of waverider buoy.

Baseline data is required to assess the potential of wave energy in Fiji. Requirements are site selection, a site survey, and buoy installation.

TONGA

Task 90.TG.7a: Continued collection of wave data.

Continued collection of wave data off the SE coast of Tongatapu is required. The waverider buoy should be kept operating with minimal interruptions and the maintenance programme upgraded to ensure this.

TUVALU

Task 90.TU.6b: Collection of wave data to assess potential of wave energy.

What is the potential of wave energy at Funafuti? To get the data required to answer this question a waverider buoy needs to be installed at a suitable site. Site selection should proceed so that when a buoy is available installation and data collection can proceed.

VANUATU

Task 90.V A.13a: Wave energy data collection.

A waverider buoy should be available for a measurement in Vanuatu in the near future. In preparation for its installation a site needs to be selected and surveyed.

Geological Hazards

PAPUA NEW GUINEA.

Task 90.PN.14a: Mapping of Tavui Caldera.

A submerged caldera, Tavui Caldera, has recently been discovered immediately north of Rabaul. A bathymetric and subbottom geophysical survey is required to confirm its presence, map it in detail, and assess its current state of activity.

Task 90.PN.14b: Heat flow mapping of Rabaul Harbour

BMR (Australia) plan to conduct a three week survey of the Rabaul Harbour to make a heat flow map for the area which will provide a base level from which changes in heat flow can be monitored. Objectives are to determine temperature distribution, thermal gradient and thermal conductivity of nearshore surface sediments primarily in Simpson Harbour. This work will contribute to the work of the Rabaul Volcanological Observatory in their efforts to evaluate volcanics hazards in the Rabaul area. Assistance is required with the survey by providing trisponder navigation equipment and operator.

HYDROCARBON PROGRAMME

FIJI

Task 90.FJ.la: Seismic interpretation and hydrocarbon prospectivity assessment of the Great Sea Reefs Area.

This study is required to complete the first phase of seismic interpretation (pre-reprocessing) and prospectivity assessments of Fiji. Available exploration data are to be interpreted and summarized in order to identify potential hydrocarbon traps. The results of this study are to be incorporated in FJ:1 Task 90.FJ.lb outlined below.

Task 90.FJ.lc: Promote the hydrocarbon potential of Fiji at major international conferences.

Promotion of petroleum prospectivity is required at international petroleum-related conferences. Promotional poster material and papers are to be widely presented to maximize the promotional effort in the most cost-effective way. Suitable conferences for this promotion include the Circum-Pacific Energy and Mineral Resources Conference Honolulu 1990, and the first PNG Petroleum Convention, Port Moresby, 1990.

Task 90.FJ.1d: Coordinate a regional hydrocarbon policy seminar for attendance by senior civil servants and senior energy/policy/legislation advisers (June 1990).

Previously recommended changes to Fiji petroleum legislation and taxation are to be discussed and considered within a regional context at a seminar at present scheduled for June 1990 (subject to funds being available). Consideration is to be given to the legislative section of a planned brochure to promote hydrocarbon prospectivity (Task 90.FJ.1b).

Task 90.FJ.1e: Coordinate evaluation of hydrocarbon source-rocks and reservoir rocks.

Provide guidance and assistance in sampling of rocks (both outcrop and cores), get samples analysed, and evaluate results. Recommend appropriate further work.

Task 90.FJ.1f: Palaeontological dating and biofacies analysis of onland samples from sedimentary basins.

Detailed geological mapping by MRD is significantly adding to the knowledge of the evolution of sedimentary basins in Fiji. Palaeontological dating and biofacies analysis is required to complete the geological investigations. Assistance is required to get onland samples analysed and the results evaluated.

PAPUA NEW GUINEA

Task 90.PN.7a: Develop comprehensive exploration plan for New Ireland Basin.

The New Ireland Basin which extends from New Ireland and New Hanover northeast to the top of the Manus Trench slope, has been shown to contain thick sedimentary sequences of Eocene and younger age and possible Miocene reefs. A thick shelfal carbonate sequence occurs onshore _ the Miocene Lelet Limestone. In order to better resolve the geological history, the tectonic style and the petroleum potential of the basin, the major unsolved problems which must be addressed are: whether it contains high quality source rocks, whether the supposed reef come into shallow water, what the thermal gradient is and whether a "bright spot" off New Ireland is a gas/water or gas/oil contact. In regard to further or future work in the Basin, PNG requests the following:

- drilling on New Ireland to test thickness and character at depth of the Miocene Lelet Limestone;
- gas sampling over the "bright spot" and heat flow profiles to establish thermal gradient;
- regional multi-channel seismic as well as detailed multi-channel seismic over "bright spot" and buried reefs in shallow water;
- seismic magnetic and gravity profiling over proposed Tabar-Feni fault zone; and
- aeromagnetic and/or swath mapping along Tabar-Feni fault zone.

SOLOMON ISLANDS

Task 90.81.10a: Preparation of legal framework for hydrocarbon exploration and exploitation.

Short term consultancies are required to assist formulate petroleum regulations for Solomon Islands' Petro-Act. This work is to be completed as soon as possible ready for final presentation at the proposed workshop on hydrocarbon development and management policies in Pacific island countries for senior government officials in 1990.

Task 90.81.10b: Assist locate and obtain basic geophysical data collected in Solomon Islands by oil companies.

Basic data to be retrieved include the Pacific Energy and Minerals tapes for the Iron bottom Sound survey.

Task 90.81.10c: MCS and other data reprocessing.

Supervise experimental reprocessing of basic data, if obtained under Task 90.S1.10b above.

Task 90.SI.10c: Source-rock, reservoir, and stratigraphic drilling.

Rock samples are required for source-rock, reservoir and stratigraphic studies. A cored borehole on North Guadalcanal is requested and assistance with project coordination, sampling, and sample analysis is required.

Task 90.81.10g: Promotion of hydrocarbon prospects.

Assistance is requested in the promotion of hydrocarbon potential through publication of brochures and attendance at meetings.

TONGA

Task 90.TG.5a: Promotion of Tonga hydrocarbon potential.

Promotion of the results of hydrocarbon potential studies recently completed are required. The Lands and Survey Department, Tonga requires assistance in preparing and publishing a promotion package for presentation to oil companies. Techsec is also requested to assist further by data presentations at international conferences.

Task 90.TG.5b: Magnetic survey of Ha'apai and Nomuka Groups.

A recent magnetometer survey was conducted in the island groups of Ha'apai and Nomuka to determine which, if any, of these islands have cores of volcanic material. Interpretation and publication of this data is requested.

VANUATU

Task 90.VA.2a: Source-rock studies in association with ODP programme.

Support and collaborate with the ODP work scheduled for 1990 with a particular view to obtaining and analysing potential source rock samples.

Task 90.VA.2b: Reinterpretation of existing MCS data.

Existing multichannel seismic data needs to be obtained from the agencies which collected them and where appropriate have them reprocessed and reinterpreted. This work should lead to a reassessment of the hydrocarbon potential of Vanuatu.

Task 90.VA.2c: Promotion of Vanuatu hydrocarbon potential.

Recent work (Tripartite Cruise Programme) has produced an assessment of hydrocarbon potential of Vanuatu. A glossy publication aimed at interesting oil companies in taking out prospecting licences in Vanuatu waters is required. Assistance is also required in circulating copies of this publication to oil companies.

OFFSHORE PROGRAMME

(Ongoing Activities: Coordination of foreign geological and geophysical research vessels in member countries waters, assist with planning and inform member countries of results of work done.)

Deepsea Minerals

COOK ISLANDS

Task 90.CK.1a: Assist with the evaluation of nodule potential in the Southern Cook Islands.

Techsec will continue to promote cruises to evaluate the manganese nodule potential of the Cook Islands EEZ. If the Japanese programme continues beyond 1989 Techsec will negotiate a cruise in Western Samoa and Cook Islands waters in the 3rd quarter of 1990 On the Hakurei Maru No.2. In the Cook Islands the focus of this cruise could be the area to the west and south of Rarotonga. Information collected by the Sonne cruise to Aitutaki Passage will be incorporated into this study.

Task 90.CK.7a: Assist in the survey for crusts in the Southern Cooks.

If the current Japanese five year nodule and crust programme is extended then when the Hakurei Maru No.2 works in the Southern Cook Islands assessing the nodule potential, opportunities should be taken to dredge the sides of any seamount encountered at depths of 1000-2000 m for crusts.

KIRIBATI

Task 90.KI.2a: Review of work done on 1989 RV Hakurei Maru No.2 cruise.

During August-October 1989 a two-month long cruise studied nodules and crusts in the southern part of the Line Islands. Results from this cruise should reach Techsec mid 1990. A summary of results and conclusions will be required with recommendations for further action.

Task 90.KI.5a: Review of work done on RV Hakurei Maru No.2 cruises.

During August-October 1989 a two-month long cruise studied nodules and crusts in the southern part of the Line Islands. Results from this cruise should reach Techsec mid 1990. A summary of results and conclusions will be required with recommendations for further action.

PAPUA NEW GUINEA.

Task 90.PN.8a: Study of Hydrothermal vents in the Western Woodlark Basin.

The PACLARK Project is a joint Papua New Guinea, Australia, and Canada study of hydrothermal vents in the Western Woodlark Basin. The major aim of the Project is to locate and study mineral deposits forming around active hydrothermal vents. Three cruises have been completed and funding is being sought for the next phase, detailed direct observations using either a submersible or ROV. PNG requires assistance in securing funds for this next phase.

WESTERN SAMOA

Task 90.WS.7a: Survey of new cobalt-rich crust sites identified from new data.

If the extension to the Japanese Deepsea Mineral Resource Programme is approved then assistance is required to coordinate and assist with planning of the 1990 cruise of the Hakurei Maru No.2.

Seabed Mapping

GUAM

Task 90.GM.1a: Preparation of index of offshore data.

Prepare a list and index map of all geological and geophysical data that has been collected in Guam's EEZ, including identification of type of data collected, quality, and locality of repository.

TONGA

Task 90.TG.4a: Synthesis and publication of geological and geophysical work in the Lau Basin.

There have been a series of very successful cruises recently in the Lau Basin, including seabed mapping in the northern Lau Basin using Gloria. Full analysis and publication of all the accumulated data is requested.

TUVALU

Task 90.TU.8a: Mapping of Funafuti Lagoon.

Compile all information to date and prepare a bathymetric map of Funafuti Lagoon. Data acquired from the survey of Funafuti Lagoon with respect to the borrow pit filling pilot project should be incorporated into the map.

Task 90.TU.8b: Bathymetric mapping of seamounts in Tuvaluan area of Northern Melanesian Borderland.

A compilation of existing information held at Techsec to be made and a "fast draft" contour map prepared. Reconnaissance bathymetric surveys of seamounts in the Northern Melanesian Borderland in southern Tuvalu waters to be conducted as ships of opportunity become available. Mapping is to be conducted in conjunction with reconnaissance surveys for Corallium and cobalt rich-crusts.

TRAINING PROGRAMME

(Ongoing Activities for 1990 include:

A. Courses

1. Certificate in Earth Science and Marine Geology - 12 week course at USP and SOPAC for 15-20 participants;
2. First degree training (SOP AC Scholarship Scheme) - 9 scholarships, one each from 9 different member countries;

B. On-the-job Assignments

1. Training at Techsec (SOPAC Fellowship Scheme) _ 15-20 fellowships;
2. Training during field work and cruises - 12-15 opportunities available;
3. Training at places other than Techsec - about 8 opportunities are available for training outside the SOPAC region;

C. Workshops & Seminars

1. SOPAC Coastal Mapping Workshop - Guam, 2 weeks in June/July;
2. SOPAC Annual Session Workshop - Fiji, Tuvalu, and Kiribati, 2 weeks in September;
3. Other Workshops - include workshops on Deepsea Research and Exploration (Tonga in March), Mineral Exploration (Papua New Guinea in June), Data Management (Fiji in late 1990), and Petroleum Exploration Policy (Vanuatu in August);

D. Training Assistance

1. Ocean Resource Resource Management Course at USP - assist with teaching;
2. Other Training Assistance - Introduction to Earth Science Course (second 3 week course in Papua New Guinea).

FIJI

Task 90.FJ.Ta: Training of MRD electronic support staff on the maintenance and operation of geophysical survey equipment.

Both group training and on-the-job training at Techsec on the maintenance and operation of marine geophysical equipment is required for MRD technical staff.

Task 90.FJ.1b: Short term attachments at overseas institutions for MRD electronic staff.

Training of MRD electronic technical staff at appropriate overseas institutions is requested. Short term attachments should be at institutions who use equipment similar to that used by MRD in marine geological and geophysical surveys.

Task 90.FJ.Td: Remote sensing processing.

Training is requested on a project basis for Fiji nationals in the use of the microBRIAN image processing system.

Task 90.FJ.Te: Strengthening hydrocarbon manpower at MRD.

Four man weeks of on-the-job training at Techsec is required in petroleum geology and geophysics for a national geologist.

PAPUA NEW GUINEA

Task 90.PN.Ta: Special Basic Earth Science Course in PNG.

The three-week course on basic earth science conducted in June 1989 in PNG was a great success. PNG requests that a follow-up three week course be conducted in 1990 and that it focus on specific subjects such as petrology and stratigraphy, or petroleum geology and geophysics, or possibly two separate course on the above topics.

TECHNICAL SERVICES PROGRAMME

Data Management

Task 90.FJ.21a: Computerization of hydrocarbon database.

Existing seismic shotpoint maps and interpreted seismic profiles need to be digitised so that data can be processed and maps of structure contours, isopachs, etc. be prepared. MRD will provide a technical assistant. Computing facilities and task supervision are required.

Task 90.FJ.21b: Trackplot index of all swath mapping data in Fiji's EEZ.

Index maps are required showing coverage of bathymetric and image swath information within Fiji's EEZ. Maps should show sufficient detail so that they can be used for planning purposes.

Task 90.PN.15a: Management of hydrocarbon data.

The Papua New Guinea Geological Survey continues to require assistance in managing its hydrocarbon data system. It is requested that the service provided by Techsec continue.

Task 90.81.22a: Provision of in-country computing facilities.

(training) Supply an IBM PC computer, peripherals, software and assist with its installation and usage

Task 90.VA.7a: Computer support.

Assist with expanding in-country computing facilities by providing IBM PC-AT computer and basis software set to aid in-country SOP AC work activities.

Task 90.WS.9a: Assistance in the use of GIS

Western Samoa has recently received a Geographic Information System (GIS). Assistance and detailed advice in its use in coastal and nearshore activities is required, particularly those activities of direct relevance to the SOPAC Work Programme.

Technical Information

COOK ISLANDS

Task 90.CK.Sa: Continued production of lagoon and nearshore bathymetric maps.

Work at Techsec continues on Aitutaki 1:200,000, Mangaia nearshore, Pukapuka lagoon, and Suvarrow lagoon bathymetric maps. A colour airphoto set of Suvarrow flown in June/July 1985 by the Australian Armed Forces will provide useful information.

Task 90.CK.IIa: Rarotonga Coastal Map.

Conservation Department with assistance from the Survey Department are correcting and adding new information to the 2 coastal maps of Rarotonga prepared by Techsec. When completed the two maps will be published by SOPAC.

Task 90.CK.IIb: Aitutaki colour satellite image maps.

Techsec to investigate the possibility of publishing in map form processed images and interpretations of those images.

FIJI

Task 90.FJ.6b: Assistance for technical editing and publication.

MRD's search for a cheaper source of energy was directed at Ocean Energy in the late 1970's, in particular OTEC. Baseline data for OTEC have been collected around Viti Levu since mid 1980's. Using this baseline data Fiji is to produce a dossier to promote more research into the possibility of establishing a pilot OTEC project in Fiji waters. Techsec assistance is needed for technical editing and publication of the OTEC dossier compiled by R. Holmes.

Task 90.FJ.21c: Strengthening Information Services

The Library for the Mineral Resources Department is administered by the Department of Education. Fiji requires the investigation of options for strengthening the Mineral Resources Department information services, in close cooperation with the MRD library staff and the Department of Education.

Task 90.FJ.21d: Technical editing assistance.

Assistance is required with the review, editing, and preparation for publication of the bulletin on the geology of Suva Harbour by Shorten.

SOLOMON ISLANDS

Task 90.s1.22b: Strengthening Information Services.

The Ministry of Natural Resources administers a small library which has been in existence for some years. The Geological Survey Division library is part of this collection. A technical records unit, with reports, maps and photographs exists alongside of the library. Current staffing consists of one person with some drafting training plus a clerk. The Solomon Islands requires assistance in strengthening information services for the Geological Survey Division in cooperation with current library staff, by assessing the present organisation and content of the library and technical records unit in order to recommend directions for development.

TUVALU

Task 90.TU.8a: Mapping of Funafuti Lagoon.

Compile all information to date and prepare a bathymetric map of Funafuti Lagoon. Data acquired from the survey of Funafuti Lagoon with respect to the borrow pit filling pilot project should be incorporated into the map.

VANUATU

Task 90.VA.8a: Publication of geological map of Vanuatu region.

This is a joint USGS-Vanuatu project. By 1987 it was reported that the northern and central parts of the 1:1,000,000 map were complete and compilation of the southern part was being carried out in association with ORSTOM. A preliminary rough draft of the map has been prepared. It is requested that the map be completed and published.

Task 90.VA.12a: Coastal maps of parts of Efate.

Coastal maps of parts of Efate have been prepared from data collected during the 1983 CCOP/SOPAC-USGS Coastal Mapping Workshop. Publication of these maps is requested.

WESTERN SAMOA

Task 90.WS.9b: Improvement of library facilities at Apia Observatory.

It is requested that assistance be provided to advise Apia Observatory on ways of improving and upgrading its library facilities, and to assist in making these improvements.

Task 90.WS.11a: Nearshore detailed bathymetric mapping.

Prepare a set of maps for both Upolu and Savai'i showing detailed nearshore bathymetry for the depth interval 0-500 m. The depth interval around 150-250 m is of particular interest to fisheries for their deepwater fisheries research and development programme.

Task 90.WS.11b: Detailed bathymetric mapping of offshore banks.

Compile and prepare detailed bathymetric mapping of banks near Pasco Bank, especially for depths 0-500 m.

Task 90.WS.11c: Development of a mapping work plan.

Techsec have assisted Apia Observatory set up a drawing office so that the Observatory can take advantage of training received by their staff at Techsec on bathymetric and other map production. For the office to become operational assistance in developing a detailed work plan is required.

**SOUTH PACIFIC APPLIED GEOSCIENCE COMMISSION
SOPAC**

Summary of Co-ordination and Cooperation with other
South Pacific Regional Agencies
March, 1990

COASTAL & NEARSHORE PROGRAMME

1. *USP:*
 - a) *Institute of Natural Resources (INR), Atoll Research Centre*
 - coordination and mutual assistance in nearshore studies with overlapping interest (sediment budgets, sediment chemistry, water quality, current measurements, etc), specifically in relation to SOPAC projects in Kiribati (Tarawa Lagoon), Tuvalu (Funafuti Lagoon), and Solomon Islands (Marovo Lagoon);
 - b) *Institute of Research, Extension, and Training in Agriculture (IRETA)*
 - joint work on monitoring fill material during Borrow Pit Pilot Project on Funafuti, Tuvalu.
2. *SPC:* *South Pacific Regional Environmental Programme (SPREP)*
 - coordination of coastal and nearshore activities of mutual interest, including SOPAC field surveys related to dredging/sand mining, resource management (especially precious corals), coastal erosion, coastal development and engineering works, and sealevel studies in Cook Islands, Fiji, Kiribati, Solomon Islands, Tonga, Tuvalu, Vanuatu, and Western Samoa.

HYDROCARBON PROGRAMME

1. *Forum Secretariat:* *Energy Division*
 - cooperation in the formulation of fiscal policy related to exploration and exploitation of hydrocarbons in the region (especially Fiji, Papua New Guinea, Solomon Islands, Tonga, and Vanuatu).

OFFSHORE PROGRAMME

1. *PIDP:* *EWC/Resource Systems Institute (RSI)*
 - information exchange and joint review of economic potential of deepsea mineral resources.

TRAINING PROGRAMME

1. *USP:* *Institute of Marine Resources (IMR)*
 - jointly run 12 week Certificate in Earth Science and Marine Geology;
2. *FFA/USP:* *Ocean Resources Management Programme (ORMP)*
 - SOPAC; assists with teaching that part of the course dealing with non-living resources;
3. *SPC:* *South Pacific Regional Environmental Programme (SPREP)*
 - SOPAC's attendance at and support of SPREP workshops and other meetings organised by SPREP, and attendance at each others annual work programme meetings.

TECHNICAL INFORMATION

1. USP: Library/Pacific Islands Marine Resources Information System (PIMRIS)

- SOP AC is responsible for providing bibliographic references on non-living resources from its own non-living resources data base to the USP based PIMRIS data base, and is-actively assisting with the development of PIMRIS's objectives by being a member of the PIMRIS Steering Committee;

2. USP/FFA/SPC/EWC: Libraries

- mutual assistance and regular exchange of relevant publications, reports, proceedings, and similar documents.