APPENDIX 3

REPORT of the
SCIENCE, TECTONICS & RESOURCES (STAR)
MEETING

sponsored by

SOPAC and IOC
held in Conjunction with the
21st Annual Session of SOPAC

24-26 September 1992
Nuku'alofa, Tonga

1. OPENING OF THE SESSION

(a) The Chairman, Dr Keith Crook called the meeting to order at 11am on Thursday, 24 September 1992 at the Ramanlal Hotel, Nuku'alofa, Tonga. Sione Tongilava welcomed the participants to Tonga.

(b) The draft agenda was moved for adoption by Bill Barclay and seconded by Neville Exon.

(c) The election of chairman and vice-chairman was deferred to later in the meeting. Neville Exon agreed to be rapporteur.

2a. STAR BUSINESS

Review of Recommendations of 1991 STAR Meeting: Don Tiffin reviewed the recommendations and progress made on their implementation. It was suggested that the Secretariat should consider preparing a one-page document setting out SOPAC requirements for reporting to member countries by cruise leaders.

2b. CHANGE OF FORMAT OF STAR/TAG SESSIONS

1. **Recognising** the funding problems and importance of interaction, Techsec has requested STAR's comments on the Review Mission's recommendation of a possible change to future programming to streamline the STAR, TAG, and Budget & Policy Annual Sessions.

2. The Review Mission provided strong general support for SOPAC's activities but also identified problems with the present format and the cost-related length of time of the meetings.

3. **Recognising** SOPAC's funding and staffing constraints, together with the imortance of continued interaction between scientists/technologists and policy makers/administrators, STAR believes that restructuring of the STAR/TAG part of the Annual Session can be accomplished without detriment to either, and offers the following for consideration:

4. From STAR's perspective the Review Mission Report focusses too narrowly on the SOPAC Secretariat Work Program and fails to adequately incorporate in its recommendations the extensive scientific program being conducted in the region and its interaction with SOPAC's own program. In STAR's view some of the recommendations would have serious negative impact on these interactions and if promulgated could result in the loss of many of the gains and advantages that have accrued as a result of our past close interactions.

5. STAR does agree that structural changes in the meeting format need to be made but believes that our common goals can be better reached by a meeting structure that would be shorter and less expensive than the current one, but would preserve and enhance the close science/technical/policy interactions that have contributed to SOPAC's success. Moreover, our new meeting format should assist in repairing the breakdown of communication between the various SOPAC groups that were identified in the report.

6. **STAR recommends that serious consideration be given to adopting a meeting format along the following lines:**

Friday, Saturday	Thematic STAR/TAG Session
Monday morning	Plenary opens
Monday afternoon	STAR/TAG Results presentation
Tue to Thur morning	combined STAR/TAG
Tue to Thur afternoon	Budget & Policy session and concurrent scientific and technical poster session
4-6pm Mon to Thur	Working Group activities STAR/TAG and/or B & P
Friday (if necessary)	Budget & Policy final session.

7. STAR further recommends that each STAR/TAG session will commence with scientific and technical reports of accomplishments. These will consist of some formal talks and some brief presentations. These presentations will be followed by discussion and formulation of work program elements for incorporation in future SOPAC/Techsec programs or scientific investigations under the SOPAC umbrella. Recommendations relating to Budget & Policy issues will be flagged and forwarded for later consideration. Reports of in-progress work are generally to be summarised in writing rather than verbally.

8. During the sessions a number of issues were discussed and are summarised into the following points:

9. A majority of the members of STAR are also members of TAG and many have attended most of the sessions of STAR and of TAG over the past decade or more. As such we have had the benefit of watching with interest the evolution of SOPAC and its transformation into a very successful and effective independent regional organisation whose strength is its scientific output. We have also watched the evolution of the meeting format during this period. We believe

that a situation has developed in the past few years whereby the budget and policy implications and decisions have been divorced from the discussion and justification of work program elements. The format presented above would allow a closer coordination of these activities in the future.

10. From our experience of taking part in both STAR and TAG over the year, STAR agrees that there is merit in merging both STAR and TAG into a one week science session to avoid duplication and to focus on action needed by SOPAC to further the Nearshore, Offshore, and Hydrocarbons needs of the region.

11. The initial Friday & Saturday sessions could be devoted to the topical theme for that year and rotated each year as necessary between Nearshore, Offshore, and Hydrocarbons. The advantage of this format would be that it would allow a more complete discussion of the topical theme without undue disruption of the meeting format for the following week.

12. STAR was initially established to stimulate science activity within the region. In recent years, $3 to $6 million dollars of scientific activity per year has been expended in the region as a result of these efforts. The interest and maturity of scientific activity in the area suggests that it will continue provided the region continues to encourage these activities.

13. Combining the STAR and TAG sessions will allow for maximum interaction between scientists/technicians from the island countries and scientists from advisory countries. We believe that this interaction has a two-fold benefit: it allows member country representatives to obtain a quick update on the latest advances in the sciences and it allows the visiting scientists to meet the local scientists/technicians, learn more about the local needs, and to devise programmes to help the countries. STAR scientists can recall a number of SOPAC programmes that have resulted from this local contact between them and the member country scientists, viz the Kiribati manganese nodule program, the Vanuatu submersible studies program, the North Fiji Basin triple junction program, etc.

14. In defence of the above recommendation STAR emphasises that SOPAC has a reputation for excellence because it is a unique and superior regional cooperative program which serves as a prime mode for interdisciplinary well-coordinated scientific/technical activity. The beauty of the meeting is the mixing of the science/technology/bureaucracy in a closed environment where there is no escape allowing people to mix and interact.

15. STAR is very concerned about the current trend towards reducing the number of Island scientists/technologists attending the Annual STAR, TAG, and Budget & Policy Sessions. STAR believes that every effort should be made to maximise attendance by knowledgeable Island scientists/- technologists at the annual Sessions. Attendance by key elements of the SOPAC technical staff contributes significantly to the effectiveness of the sessions, and is also an importance aspect of the training of the technical staff.

16. At the same time we believe that it is exceptionally valuable for individuals involved in budget and policy decisions to become more knowledgeable of the contributions that science & technology can make to regional development and resource utilisation.

17. Both of the above goals (paras 14 & 15) can be accomplished if scientists, technologists and policy makers all participate as equals in SOPAC activities.

18. The region should be aware that scientists from donor countries attending the STAR session come at no extra cost to SOPAC. If their attendance were to be costed the following should apply:

30 scientists (consultants) @ $500/day		
	=	$105,000
30 scientists travel & perdiem	=	$150,000
TOTAL COMMITMENTS	=	$255,000

The value of 30 scientists attending the STAR sessions and interacting with the regional scientists cannot be overestimated. Any change that decreases this participation would be a substantial loss to the region.

19. **STAR strongly recommends that the STAR/TAG combined session meets every year in conjunction with the annual Budget & Policy Sessions for the following reasons:**

(a) This allows for maximum interaction between the regional scientists and the visiting scientists

(b) Frequent participation by island nationals in scientific forums such as offered by STAR/TAG forum is essential to growth of scientific infrastructure within the SOPAC region.

(c) Cruise planning is done on a yearly basis and important work elements can often be incorporated at no additional cost.

(d) A meeting every 2 years would also reduce continuity and most like result in cruise planning activities occurring elsewhere without regional input.

20. STAR feels strongly that the combined STAR/TAG meeting should be at least 5 days long. It does not agree that the TAG portion should every alter-

nate year be allocated only a short one day session in the Budget & Policy Session. Overseas scientists and policy makers would face almost unsurmountable problems requesting funds from their host governments to give one day of advice and spend 2 to 4 days in travel.

21. STAR feels strongly that meetings should be held in the member countries wherever feasible. This would allow for maximum interaction between scientists/technologists of the host country and scientists from other countries. It is also of considerable economic benefit to the host country.

22. Attendance at meetings such as SOPAC is a two-way street. Island nations benefit from picking the Technical brains of STAR/TAG participants and STAR/TAG Technical people gain knowledge from regional and other supporting country scientists. Time must be allowed for this process to take place - one day is too short.

23. Drastic reduction of STAR/TAG contribution to SOPAC may send wrong message to donor countries and would indicate a decline for desire of Technical assistance, thus creating difficult conditions for STAR/TAG participants to obtain funds for travel to SOPAC Sessions. The resulting decrease in Research and Development work can only be to the detriment of the member countries.

24. SOPAC member countries would lose critical candid reviews of work programmes and equilibrium would be upset with the balance resting with policy and budget people. A balance should be maintained between Technical input and funding desires.

25. SOPAC's success is being envied by many regional organisations and several regional bodies are considering going to the SOPAC model of integrated science, technical, service and policy discussions. We thus find it strange that the Mission Report proposes a change in structure to downplay this element of success.

Summary

STAR believes the interests of the region can best be served by streamlining the Annual Sessions so that STAR and TAG and the Budget and Policy Sessions can interrelate better. This would allow for maximum interaction between regional scientists/policy makers and visiting scientists. STAR believes that Sessions should continue to be held annually and continue to be rotated amongst the member countries so as to maximise interaction with regional personnel. Attempts to squeeze technical discussions into a one-day session will not work as scientists will not be willing to spend so much time and effort in travelling for such a short session. In kind support by visiting scientists is worth over $250,000 each year and is provided at no extra cost to SOPAC and should be continued for the benefit of the region.

3. ACTIVITIES OF STUDY GROUPS:

Chairing and Meeting arrangements: It was agreed that, as coastal and nearshore processes and resources had been covered at the preceding workshop, there was no need to meet as a study group. Information Exchange was a group that should be chaired by a Secretariat member, and was in abeyance this year; ideas for the future should be put to the Secretariat before the next STAR Meeting. Remote Sensing was to be incorporated into this Group.

Because most people are interested in all three areas, a major group entitled " Tectonics, Drilling and Sea Floor Mapping" should meet. This group would include both ODP and island/lagoon drilling study groups, and could break up into smaller working groups as necessary. Two areas of special concern were ODP, where a key West Pacific Planning Meeting is to be held in California, in January 1993; and swath-mapping, because of the need for the future publication of new maps, either in a new atlas, or for the HIG Atlas.

The Ocean Basin Mineral Resources and Technology Group was to include discussions on Submersibles and ROVs. The Hydrocarbon Group remains important and should meet.

3a. RECOMMENDATIONS OF THE HYDROCARBONS STUDY GROUP

(Convenor: Jonathan Rodd)

The Study Group;

1. **Noted** that Petroleum data packages for Solomon Islands, Vanuatu, Fiji and Tonga are being prepared, and catalogues of data held, together with petroleum brochures will be mailed by Techsec to oil companies worldwide.

As part of the promotional effort for the region, the Study Group **recommends** that promotional visits to oil companies be organised to inform them of regional petroleum prospects.

2. **Recognising** that the relationship of tectonic history to the distribution of Tertiary reefs and potential petroleum source rocks, a problem of key scientific and commercial importance in the region;

Realising that programs of acquisition of high-quality multi-channel seismic data are needed in key prospective areas identified by earlier work to better address this problem; and,

Noting that BGR had offered the RV "Sonne" for a cruise in the region in 1994, if a suitable program could be developed;

Recommends that SOPAC approach BGR, with a view to using the "Sonne" for hydrocarbon-related geoscientific research in that year; and that SOPAC, in conjunction with BGR, seek a multichannel seismic system for use in the research program.

3. **Recognising** that RV "Rig Seismic", with a high-quality seismic system, would be available if funding could be found.

Recommends that SOPAC continue to seek ways and means of obtaining such funding.

4. The Study Group **noting** that evidence of oil and gas seeps and source rocks in the region is very limited, and that a greatly increased database is needed;

Recommends that SOPAC seek to upgrade its program of source rock evaluation, using unweathered samples and new techniques.

3b. RECOMMENDATIONS OF THE OCEAN BASIN MINERAL RESOURCES AND TECHNOLOGY STUDY GROUP

(Convenor: Michael Cruickshank)

South Pacific Metallogenic Mapping Project

The Study Group,
Recognising the extremely high scientific value of this proposed project, because it will bring together disparate data from on-shore and offshore areas and will display them in a manner leading to greater understanding of mineralisation patterns and their controls within the region;

Realising that metallogenic maps and their accompanying data bases would assist the promotion of mineral exploration activity in the region;

Noting that the Fiji MRD is well-advanced in assembling the scientific materials needed to begin this project; and,

Believing that developing this project using the Fijian data will lead to a workplan and procedures applicable in other countries in the region;

Recommends
(i) that SOPAC give high priority to facilitating the commencement of this project, and;

(ii) that the project commence with a pilot study using Fijian data to standardise methods of compiling, presenting and displaying the metallogenic data.

Comparative Studies of On-Land and Offshore Volcanogenic Massive Sulfide Deposits

The Study Group,
Noting the widespread international interest in comparative studies of VMS deposits;

Recognising the highly complex tectonics of the region and the strong linkages between on land and offshore geology;

Realising that geological and geophysical studies are lacking in many critical in-shore areas; and,

Stressing the need for comprehensive petrographic and geochemical studies of VMS deposits both on and offshore in the region.

Recommends that
(i) SOPAC take steps to ensure that studies of on-land VMS deposits in the region include the acquisition of relevant petrographic and geochemical data; and,

(ii) that SOPAC request its members to identify and prioritise inshore areas in which additional marine geological and geophysical studies are required.

(iii) that SOPAC actively seek and encourage the three-dimensional characterisation of sub-marine hydrothermal systems in areas of VMS deposition, in cooperation with other organisations.

Manganese Nodules and Cobalt-rich Crusts

The Study Group,
Recognising that manganese nodules, cobalt-rich crust and island phosphate deposits continue to be valid exploration targets in the region;

Noting that substantial database now exist for manganese nodules, but that additional data are needed in respect to crusts; and,

Realising that data on many seamounts of potential interest are quite limited;

Recommends to SOPAC
(i) that priority be given to extending the minerals information base for Guam, Kiribati, Tuvalu, Federated States of Micronesia and Marshall Islands;

(ii) that separate regional memoirs with accompanying maps be prepared covering manganese nodules and cobalt-rich crusts;

(iii) that additional field work on seamount characterisation be encouraged and supported;

(iv) that SOPAC continue to keep fully up to date on advances in technical and environmental aspects of marine minerals development, including the disposal of mining wastes.

Sand Mining

The Study Group,
Recognising the continuing need of many countries in the region for sand and aggregate and the need to utilise these resources in terms of economically and environmentally sustainable development;

Recommends to SOPAC that efforts to assess the sand and gravel resources of island countries be continued and that continuing technical advice be sought from donor countries on the developmental aspects of sand and gravel mining.

3C. RECOMMENDATIONS OF THE TECTONICS STUDY GROUP
(Convenor: Loren Kroenke)

1. The Study Group, **recognising** the unparalleled opportunity to study and understand the underlying, fundamental geodynamic processes that govern the formation and development of the world's trenches, volcanic arcs, and back-arc or marginal ocean basins afforded by the unique tectonic setting of the Southwest Pacific region;

Welcomed and endorsed on-going initiatives from Australia, Canada, France, Germany, Japan, the United Kingdom and the United States for work in the Lau Basin, Manus Basin, North Fiji Basin, western Solomon Sea, western Woodlark Basin, the New Hebrides and Tonga Arcs and elsewhere in the South Pacific region.

2. The Study Group **expressed concern,** however, that its recommendations of the last session for publishing swath-mapping and ancillary data had not been fully implemented. Such data are of crucial importance to the understanding of the South Pacific region, and the perceptions of the outside scientists who will be judging proposals for future work in the region. The French-Japanese consortium is congratulated for their recent publication of North Fiji Basin material.

The group **identified** large quantities of data (Appendix 1) that should be published as map sheets, including Seabeam and GLORIA data, as well as interpretive products derived from these and SeaMARC II data. It is estimated that about 30 such sheets are ready, or nearly ready, for publication. The group **strongly urges** SOPAC to accord to very high priority to publication of such data, and further **urges** SOPAC to seek donations from donor countries to expedite the publication of the SOPAC regional tectonic map, and the new sediment distribution map.

Accordingly the Study Group **recommends:**

(i) that SOPAC seek funding for publication of bathymetric and sidescan sonar results within a SOPAC Seafloor Atlas Volume;
(ii) that an initial publication of 28 sheets, followed by a second publication of similar size;
(iii) that publication of the first series begin by March 1993, followed by a second series, as soon as practicable.

3. The Study Group, **considering** the tectonic complexities of the Southwest Pacific with its multiplicity of active-plate and paleo-plate boundaries, the latter captured in various stages of development, **concluded** that a considerable amount of additional investigative work is required in the region. Four phases of arc-trench and backarc basin development through plate convergence in the Southwest Pacific during the Cenozoic have resulted in a unique natural laboratory for the study of proto-continental foldbelt evolution, the generation of mineral deposits, and the interactions between plate tectonics and global climate change. Knowledge of these areas will be underpinned by continuing fundamental research of the mechanisms and geological products of plate convergence.

Leg 134 (Vanuatu collisional convergence) and Leg 135 (Lau Basin opening) of the ODP have recently highlighted the existence in the Southwest Pacific of many of the best global examples of the products of plate convergence. Major opportunities remain for further study of topics with world-wide application, including the initiation of subduction and growth of island arc crust, the initial stages of backarc basin opening, and the products of collisional convergence.

The initiation of arc volcanism, for instance, remains very poorly understood, with deep-seated evidence from continental foldbelts and old arc basements being complementary to the shallow level information deduced from active arcs. In the Southwest Pacific, recent studies have suggested that highly oblique convergence of the South Fiji Basin with the North Fiji Basin has generated the Hunter Ridge as a major bathymetric feature extending from southernmost Vanuatu to Fiji. This structure provides perhaps the best example of initiation of an intra-oceanic arc and deserves detailed study.

Backarc basins represent a key element of most convergent plate boundaries in the western Pacific. ODP drilling in the Bonin-Mariana and Lau backarc basins has shown a diversity of styles of development. Early Lau Basin opening was complex with initial extensional rifting of pre-existing arc crust followed by

MOR type divergence at transient spreading centres. The Vanuatu (New Hebrides) backarc basins are at an embryonic stage of development that might offer a glimpse of what the Lau Basin looked like 8-10 Ma ago.

Moreover, forearc and backarc regions probably represent the 'source' areas for most ophiolites in Phanerozoic foldbelts, and represent potential sites of first collision during continuing plate convergence. Leg 134 of ODP addressed collision of an aseismic ridge with a forearc region in the Vanuatu arc. Further opportunities exist to study forearc collisional events in the SW Pacific, including collision between a hot, active spreading ridge and an arc (Woodlark - New Georgia), between a small oceanic plateau and an arc (W Torres Massif - Vanuatu), and oblique collision of an arc platform with an arc (Loyalty Ridge - S Vanuatu).

Therefore, the Study Group **recommends**:

(i) that more detailed swath mapping and geological-geophysical studies of the embryonic New Hebrides backarc troughs be initiated so that quality data might be available to form the basis for ODP drilling in 3-5 years time. These troughs represent a stage of evolution transitional from stretching and attentuation of arc crust to initial accretion of backarc-type basalts and oceanic crust. Data from ODP Leg 135 for the Lau Basin revealed considerable complexity during the initial rifting/spreading phase of this backarc basin. The New Hebrides backarc troughs are the best developed in-situ examples of this poorly understood phase of backarc basin development. Furthermore, this transitional phase from arc to backarc crustal growth is implicated in most models of the genesis of volcanic-hosted massive sulphide (VHMS i.e. Kuroko-type Cu-Pb-Zn-Au deposits), and there is potential for the discovery of in-situ Kuroko-style mineralization in these troughs.

(ii) that a proposal be developed to investigate the initiation of subduction along the Hunter Fracture Zone. Existing morphologic, petrologic and sea-floor magnetic data suggests that subduction of the mature, South Fiji Basin has just begun beneath the active, hot, North Fiji Basin, within a complex regime of oblique convergence. This is a unique, modern, and apparently active, example of the processes of subduction initiation and growth of island arc crust. The proposal should include a program of research, including morphologic swath mapping, seismic profiling and sea-floor sampling which result in an hypothesis which can be tested and extended by the Ocean Drilling Program.

Complementary on-land studies, including deep-island drilling, of arc basement and anomalous calc-alkaline volcanism in Fiji, at the northern termination of the Hunter Fracture Zone, will contribute to the development of an overall model for the initiation of subduction and arc development.

(iii) that a proposal be developed to investigate the effects of aseismic ridge-island arc collision and subduction beneath fore-arc and back-arc basins. Notable effects include: arc segmention, island elevation, seismic gaps, intra-arc and back-arc basin rifting, and initiation and modification of volcanism. The Southwest Pacific region contains three major areas where aseismic ridge collision and subduction takes place, and therefore provides a spectrum of the effects associated with collision/subduction processes. A unique opportunity to study these processes is present. Furthermore, because subduction/collisional processes are relatively unknown and are responsible for the initiation of landslide and volcanic hazards and formation of structures significant to resource potential, it is of benefit to SOPAC to support investigations of such processes; and,

(iv) that SOPAC encourage and support the efforts of scientists to further scientific investigations in the region which would address the arc and back-arc evolutionary processes.

4. GENERAL RECOMMENDATIONS

(a) R/V *Sonne* Cruise: STAR **recommends** that SOPAC, jointly with BGR, prepare a work program including a training component, based on the expected availability of the R/V *Sonne*.

(b) Publication of STAR Abstracts: Recognising that reports presented at STAR meetings are an important contribution to SOPAC's activities; **Realising** that the material in these reports is of considerable interest to scientists from and working in the SOPAC region; and **Noting** that formal publication of the results presented may be long delayed; STAR **recommends** that the abstracts of papers presented at STAR meetings be published as part of the report of the Annual Session.

5. FUTURE CRUISES IN THE SOPAC REGION

A list of future cruises, circulated at the meeting, is given in Appendix 2.

6. STAR OFFICE HOLDERS

Keith Crook was elected as Chairman of STAR and Saimone Helu was elected as Vice-Chairman for the forthcoming year.

A vote of thanks to the outgoing Vice Chairman, Ron Richmond, who has served since the foundation of STAR, was carried by acclaimation.

7. NEXT MEETING

Fiji will offer to host the 1993 Annual Session. If possible, the timing of the STAR meeting will be co-ordinated so as to follow the IAVCEI Meeting to be held in Canberra (25 September - 1 October 1993). The suggested theme is 'Island geology and offshore correlations' and Nadi is a possible venue. A registration fee may be charged.

8. THANKS

Thanks were extended to Anna Nata and her support staff for secretarial services, to Don Tiffin and others in the Secretariat for organisation and to our Tongan hosts. Neville Exon is thanked for his work as Rapporteur.

9. PAPERS PRESENTED

A: Hydrocarbon Resource Assessment, Exploration and Exploitation

- Hydrocarbon exploration history in the Kingdom of Tonga (Saimone Helu, Tonga)
- The marginal reef play and petroleum search in arc terrains (Patrick Coleman, University of Western Australia)
- Hydrocarbon potential of the Northern Tonga Platform (Fuka Kitekei'aho, SOPAC)
- Probabilities, petroleum potential and play concepts offshore Tonga (Bill Barclay & Jon Rodd, SOPAC; John Pfluger, Bragg Ck, Alberta Canada; and Ken Harvard, Firefly Resources, Alberta, Canada)
- New targets for hydrocarbon exploratin in offshore Fiji (Jon Rodd, SOPAC)
- Hydrocarbon resource assessment,exploration and exploitation in PNG (Mark Mandibi, PNG Petroleum Division)
- Hydrocarbons Policy for SOPAC Member Countries (Jon Rodd & Bill Barclay, SOPAC)
- Australian investment abroad - what chance for SOPAC? (Ron Richmond, APEA)
- Palaeogeographic, depositional and age controls on the composition of petroleum source rocks and their derived oils (Roger Summons, AGSO)
- Petroleum prospects in Santo/Malekula Basins, Vanuatu (Jon Rodd & Bill Barclay, SOPAC)
- Results of new seismic processing in Iron Bottom Basin: Implications for reef play potential (Jon Rodd & Bill Barclay, SOPAC)

B: SW Pacific Seafloor Hydrothermal Systems Associated Mineralisation and Implications for On-Land Exploration

- Fault systems and search tactics in the search for epithermal deposits (Patrick Coleman, University of Western Australia)
- Geological setting and mineralisation of a polymetallic massive sulphide deposit at Nukudamu, Vanua Levu, Fiji (Devika Reddy, Department of Mineral Resources, Fiji; Howard Colley, British Geological Survey, UK)
- Active hydrothermal sulphide deposits associated with submarine dacite-rhyolite, eastern Manus Basin, PNG (Graeme Wheller, Fiji Mineral Resources Department, Ray Binns, CSIRO Exploration Geosciences, Australia and Steve Scott, University of Toronto, Canada).
- A draft proposal for metallogenic mapping of the SOPAC island member countries' on-and-off shore areas (E Anne Felton, AGSO)

C: Ocean Drilling Programme

- Geology of Tonga: Relevance and Impact of ODP Leg 135 drilling results (Dave Tappin, British Geological Survey)
- Clayey nannofossil ooze turbities and hemipelagites at Sites 834 and 835, Lau Basin, SW Pacific (R.G. Rothwell, IOS, United Kingdom; R.A. Hodkinson, Imperial College, United Kingdom; Cristelle Pratt, Mineral Resources Department, Fiji; P.P.E. Weaver, IOS, United Kingdom; and M.J. Styzen, Shell Offshore, United States).
- ODP Leg 134 Scientific Results (Gary Greene, US Geological Survey)
- Prospects for future ocean drilling in the SOPAC Region (Tony Crawford, University of Tasmania)

D: Regional Studies

- Sedimentology and tectonics of the western Solomon Sea, collision zone Papua New Guinea (Keith Crook, University of Hawaii; Eli Silver, University of California, Santa Cruz; Don Reed, San Jose State University; and MW9204 Shipboard Party).

- The northern ends of both the New Hebrides back-arc troughs and the North Fiji Basin: morphostructure and magnetic fabric (Results from SANTA CRUZ Cruise), (Yves Lafoy, Service des Mines et de l'Energie, Noumea, New Caledonia and Bernard Peleter, ORSTOM BPAS Noumea).
- Seabeam as a tool in coastal hazard microzoning (Graham Shorten, QUT; Robert Smith, SOPAC)
- The Northern Lau Basin - backarc extension at the northern edge of the Indo-Australian plate (Don Tiffin, SOPAC & Lindsay Parson, British Institute of Oceanographic Sciences, United Kingdom)
- Manganese nodules, deepsea environments and the effects of nodule mining (Neville Exon, AGSO)
- RIDGE FLUX Project - International cooperative research project on heat and mass flux from the Earth's interior on the ridges crests (Seizo Nakao, Geological Survey of Japan).

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