

APPENDIX 6

REPORT OF STAR AND REPORTS OF STAR TECHNICAL WORKING GROUPS

1. The STAR Program for the 22nd Annual Session of SOPAC commenced on Saturday 2 October with a very successful field trip in Western Viti Levu, led by Howard Colley of Oxford Brooks University, UK, with some 65 participants. Details of the field trip are given in the Field Trip Guide (Fiji MRD Note BP30/38).

2. The Technical Program of STAR was opened by the STAR Chairman, Keith Crook of Hawaii Undersea Research Laboratory, University of Hawaii, on the evening of Saturday 2 October. Three papers were presented and the organisation of the STAR Technical Working Groups was commenced.

3. Six STAR Technical Working Groups were constituted, co-chaired by scientists from the international research community and from the region. Details are given in Document AS22/8.3, which forms part of this report.

4. The STAR Technical Program proceeded on Monday afternoon and Tuesday, 4-5 October. Abstracts of papers presented orally and as posters are given in Document AS 22/8.1 (SOPAC Miscellaneous Report 159). The program on p. 47-49 of that document was varied in that the paper by Michael J. Cruickshank was not delivered orally, the paper by PE Ellis was delivered by Allan Jay, and additional oral presentations were made as follows:

- "Volumetric model of Monasavu Lake, Fiji" by Robert Smith
- "Videos showing the collection of 1¹/₂" hard-rock cores by the MBARE ROV using the Stakes drill; and cold water venting on faults in Monterey Bay, CA" by Gary Greene
- "Utilization of remote sensing and GIS for energy and environmental applications" by E von Eeckhout and Paul Pope.

5. The STAR Working Groups met at various times during the Annual Session. Their reports, which are attached, included recommendations to be discussed or noted at relevant points during the Session. The Hydrocarbons Working Group was subsumed into the TAG Working Group on the South Pacific Petroleum Survey which reported during the TAG sessions.

6. At the close of the STAR sessions the STAR Chairman and the Director of MRD, Fiji, thanked Graeme Wheller of MRD Fiji for his very substantial contribution to the organisation of the STAR meeting. This was carried by acclamation.

7. The Chairman of STAR, Keith Crook, and the Vice-Chairman of STAR, Saimone Helu were re-elected to hold office until the end of the next STAR meeting.

STAR TECHNICAL WORKING GROUPS SOPAC 22ND ANNUAL SESSION

1. **Coastal & Nearshore Processes & Resources**
Co-Chairs: Graham Shorten & Stevie Nion
2. **Information Exchange & Remote Sensing**
Co-Chairs: Michel Larue & Naomi Biribo
3. **Seafloor Mapping**
Co-Chairs: Chuck Helsley & Rick Rogerson
4. **Tectonics**
Co-Chairs: Loren Kroenke & Graeme Wheller
5. **Ocean Basin Mineral Resources & Technology**
Co-Chairs: Neville Exon & Tevita Vuibau
6. **Hydrocarbons**
Co-Chairs: Jon Rodd & Saimone Helu

Report of Coastal & Nearshore Processes & Resources Working Group

The Coastal & Nearshore Processes & Resources Working Group **recommends** that the SOPAC Coastal & Nearshore group should:

1. Clearly identify **priority areas** in the Coastal Protection and Management Program and the Economic Minerals, Aggregate and Water Program, in order to guide donor nations and agencies in their selection of projects to support.
2. Adopt a two-tiered approach to the work program by addressing:
 - (a) the **immediate** problems of member countries using SOPAC's resources
 - (b) the **long-term**, wider, or special problems by providing data bases to university researchers in collaboration with local agencies, and by identifying areas or topics on which SOPAC would like the researchers to work. In particular it was suggested that if SOPAC could establish seed funding for university research, then aid donors might follow up with further funding.
3. Establish a special fund supported by aid-donors to cover **travel and research costs** of, primarily, island nation research students, but not excluding foreign research students.
4. Continue to promote and develop an **integral relationship with SPREP** in its coastal, nearshore and environmental work.

5. Develop **coastal legislation and policy** which can be utilised by member countries as a model for developing country-specific legislation and policy.

6. Seek to integrate all **remote sensing facilities** in member countries into a single SOPAC facility to better address the increased needs for remote sensing in the region.

Report of Remote Sensing, GIS & Data Exchange Working Group

Co Chaired by: Naomi BIRIBO, (KIRIBATI) and B.M. Larue (Secretariat)

I - Remote Sensing

Considering the cost-effectiveness of the use of remotely sensed data, satellite images, aerial photographs, radar data, etc, SOPAC should continue to carry out the work program, in particular mapping, coastal changes, geological hazards, etc. making use of these tools.

SOPAC should be recognised as a regional focal point in remote sensing in areas under its mandate and take initiative at a regional level to develop GIS and Remote Sensing. This includes:

- Establishment of an image data base, satellite images, aerial photographs, radar data, to be shared with other regional users.
- Organise technology transfer to Member Countries through training, in co-ordination with other organisations.
- Establishment of a pool a resource to assist member countries and other regional users needs.
- Development of a proposal to be submitted to funding agencies.

II - Data Bases

The group strongly recommends that SOPAC establish linked relational index databases of all the following:

1. Ship tracks
2. Areas covered by remotely sensed imagery
 - Airborne geophysics
 - Geophysics
 - Air photographs
 - Swath Mapping
3. Bibliographic data in each country
4. Bathymetric data (if not already maintained somewhere else).

Report of the Seafloor Mapping Working Group

The STAR Seafloor Mapping Working Group met twice during the STAR meeting in Suva and reviewed the activities of the past year and the Technical Secretariat's plans of the '93-'94 period and its interim plan for the '95-'99 period.

The Working Group noted that their earlier recommendation for the publishing of an Atlas of existing swath mapping data was not implemented, nor were plans for such included in the plans for the future program. The Working Group continues to believe that there is a need for broad dissemination of these data and that much of the Seabeam, SeaMARC and Gloria data exist only in individual personal archives that are not available to scientists and planners in the region. Therefore the Working Group **recommends** that these data be incorporated into digital archives within the region and

that portions of these data appropriate for atlas presentation be compiled and made available to the region. The Working Group also **recommends** that the first stage in this process should be the establishment of linked relational reference databases of regional ship tracks, areas covered by swath mapping and information about marine geophysical data acquired during these surveys.

Database development is seen as a continuing and urgent matter for the region. Equally important is the implementation of a focused training program in the development and use of databases and GIS technology. The Working Group therefore **recommends** a regular workshop for this purpose.

The Working Group noted that the near shore and coastal bathymetric programs and the adjacent deep-sea bathymetric programs often do not overlap and **recommends** that SOPAC and supporting agencies acquire data to fill this void as opportunities arise. Moreover, wherever possible encouragement should be given to extend the deep-sea data sets up to the islands.

The Working Group noted that there is a need to establish a uniform and standard format for digital bathymetric and side-scan image data. Until such standards are established, gridded data sets which can be handled by a variety of computer platforms should be provided.

Finally, the Working Group noted the need to archive and maintain the existing digital bathymetric and side-scan data sets and to ensure the continued co-ordination of deep sea data acquisition and **recommends** continued acquisition of swath bathymetric data especially in those areas where little detailed bathymetric data are available.

Recommendations of the STAR Working Group on Tectonics

Recognizing that research-based geological investigations represent an effective means of mapping the basic geology of the SOPAC region, on which is based all subsequent investigations and assessments of hydrocarbon and mineral resources of Member Countries, as well as some aspects of geohazards, coastal geoscience, and climate modelling, the Working Group **recommended** that the following projects be encouraged and endorsed by SOPAC and SOPAC Member Countries

1) Tonga Ridge Longitudinal Drilling Transect

A drilling transect along the axis of the Tonga Ridge and in the adjacent Lau Basin can address a number of problems important not only to the region but to all intra-oceanic convergent plate margins. These problems may be expressed as hypotheses which can be tested by ODP drilling. These include:

- Initiation of Arc Volcanism and Earliest Petrologic Evolution

Boninite magmas were erupted early in the Tofua Arc evolution and are exposed near Tafahi and Niuatoputapu. They were succeeded by arc tholeiite series lavas and are interbedded with arc tholeiite in early phases of evolution. The imprint of a subduction component will increase with time.

- Effects on Forearc Structure from Collision, Subduction

and Underplating of Seamount Chains

The Louisville Seamount Chain intersected the Tonga Forearc at a low angle beginning at its north end and has progressively moved southward. Subduction, or underplating, caused a "ripple" in elevation of the forearc that will be reflected as a time-transgressive unconformity.

- Paleooceanographic Changes in Sediment and Fauna in Forearc Basins in Response to Collision with Seamount Chains

Timing the interaction of the Louisville Chain with the Tonga Arc will signal times of change in deep water circulation patterns in the Tonga Trench. These data will bear on another drilling plan.

- Changes in Mantle Chemistry (as reflected in erupted rocks of the arc and backarc) as the Backarc Basin Opens and Arc Magmatism Evolves.

The axial ridges of the Lau Basin are derived from mantle with the isotopic signature of Indian Plate MORB. A hole drilled into deep crust south of the apex of Valu Fa Ridge should carry the isotopic signature of Pacific MORB

2) *Tracing Plate Motions from the Evolution of the Pacific Deep Western Boundary Current*

The Pacific Deep Western Boundary Current (PDWBC) sweeps around the oceanic plateaus east of New Zealand and carries nutrient-rich Antarctic bottom water into the deep Pacific Ocean. It transports several times more water than all other ocean currents and is a major influence on global climate. Its history is recorded in drift deposits formed by its interaction with increasing turbidite input from New Zealand through the Bounty and Hikurangi deep-sea channels, each of which is more than 1200 km long. Overlapping drifts record the circulation history of the PDWBC as far back as the Oligocene. As such, the history should reflect the relative movements of the Pacific, Indo-Australian and Antarctic plates, leading to new information about plate kinematics. High resolution swath mapping and reflection profiling studies, should be undertaken, followed by ODP drilling into and through the drifts in order to provide the sorely needed data on the early circulation history in the Western Pacific which in all probability had a profound influence on Cenozoic paleoceanography.

3) *Location of the Eocene Plate Boundary in the New Caledonia-Loyalty Island Collision Zone*

New data from the island of New Caledonia indicate the presence of a major Eocene plate boundary in the region. The area contains geological information relating to the transition between the eastern Gondwana rift events and the initial development of the present west dipping arc system in the Tonga Kermadec system. However, the relative position of the Eocene boundary is difficult to establish.

Two models regarding this plate boundary and its role in the development of the southwest Pacific are possible. The first involves collision of an island arc attached to the Pacific plate with New Caledonia between 45-38 Ma. The second involves subduction along the west coast of New

Caledonia and the Norfolk Rise between 55-45 Ma, with obduction of the backarc crust of this arc from the east over the New Caledonian arc at 45 Ma. Both models encounter difficulties as a result of the lack of current data from the area.

Acquisition of new data from the volcanic substrate of the southern Loyalty Rise, the Cook Fracture Zone and the Norfolk Basin would determine the age, geochemistry and tectonic relations of this poorly sampled area and enable us to eliminate one of these hypotheses and refine our models of the processes which created the present southwest Pacific plate configuration.

4) *Characterization of Central and Western Pacific Seamounts*

Pacific plate motions, based on the hotspot frame of reference, are now believed to be recognizable in the alignment of oceanic plateaus and seamount chains in the northern Pacific Basin as far back as 150 Ma. At least four major changes in Pacific plate motion appear to have occurred in the late Jurassic - Early Cretaceous. These changes are believed to have occurred at approximately 145, 125, 110, and 100 Ma. Rotation poles determined for the northern Pacific trails also appear to fit most seamount chains in the Central and Western Pacific, i.e., in Kiribati, Tuvalu, and, possibly, the Federated States of Micronesia. Testing this model by dredging the flanks of many of the Seamounts and atolls in this region for volcanic rocks suitable for radiometric age dating could also afford the opportunity to map the distribution of cobalt-rich Mn crust deposits as well as possible occurrences precious corals.

5) *Origin and Early History of Oceanic Plateaus*

Formation of large oceanic flood basalt plateaus on the Pacific plate seems to be associated with major changes in plate motion. The changes believed to be observed at 145, 125, 110, and 100 Ma, also appear to coincide with or to be closely followed by the formation of the Shatsky, Ontong Java - Manihiki, western - northern Hess, and central Hess plateaus, respectively, along or near the perimeter of the Pacific plate. The most pronounced change in motion at 125 Ma, probably concomitant with the end of southwestward subduction beneath northeastern Gondwana and the beginning of northeastward subduction beneath eastern Eurasia, was followed by formation of the world's largest oceanic flood basalt plateau— the Ontong Java Plateau— at 123 Ma. Drilling into the base of the large listric fault scarps that commonly characterize the margins of these plateaus, through the top of adjoining downfaulted seafloor, will permit access to the earliest stages of plateau construction and shed light on the timing of emplacement and geochemical evolution of these large igneous provinces.

6) *Malaita Anticlinorium Drilling Transect*

The collision between the Ontong Java Plateau - North Solomon Islands Arc is the type example of an oceanic plateau-island arc collision, a fundamental element of convergent zone tectonics whose significance is increasing as our appreciation of the role of oceanic plateaus in arc deformation and continental accretion expands. All DSDP/ODP sites drilled on the plateau so far have been distant from the collision zone with the Solomon Islands Arc. A series of seismic surveys have been conducted on the Solomons Arc, but few of these cross the deformation

front onto the plateau. A first step would be a new MCS survey extending from the plateau, across the Malaita Anticlinorium and tying onto existing lines on the arc; this survey should be accompanied by swath mapping. This work would also fulfill the requirements for ODP site survey. Subsequent ODP drilling of a transect extending from the southern flank of the Ontong Java Plateau, across the anticlinorium and onto the arc will give us information on timing and rates of uplift and deformation across the whole collision zone, identify changes in volcanism through each of the stages of the collision and reversal process, and test whether the plate boundary initially jumped away from the area after collision, to be followed much later in time by a polarity reversal, or whether collision was followed more closely in time by the reversal. Drilling through to Ontong Java basement also will allow an additional control of the time over which the plateau formed, an important issue because of suggestions that the plateau may have formed over an extremely short interval, and so represent a flood basalt outpouring at an unparalleled rate. None of these issues can be adequately addressed by dredging or on-land geology, and all are of the broadest importance.

Both seismic and swath mapping site surveys as well as a drilling program need to be undertaken within the Solomon Islands EEZ, which together will provide invaluable information on basin history and productivity and seabed physiography, as well as a unique training opportunity for both Solomon Islands' geologists and shipboard scientific participants.

Noting the recent and highly successful completion of the SOPACMAPS swath mapping cruises, welcoming the publication of a special volume of Marine Geology on the North Fiji Basin, and looking forward to the forthcoming joint Japanese-French cruise in northwestern North Fiji Basin (a comparative study of active marginal/backarc basins), the joint French-New Zealand cruise (to study the transition between frontal subduction, oblique subduction and transpression between the Kermadec Trench and the onland Alpine Fault system), as well as future cruises planned for the Lau, Manus, and Woodlark Basins, the working group **recommended** that:

- As a followup to the SOPACMAPS cruises, sampling cruises should be undertaken to selected areas to define the economic potential.
- Kinematic relationships between the NFB and the Lau Basin, which are poorly understood, be clarified through additional marine geophysical/geological mapping of the junction between the two basins.
- The current, somewhat fragmentary studies of the Lau Basin be extended to include the entire basin, with a view toward synthesising of the tectonic development of the basin.

Recognizing the interest to SOPAC nations, as well as the scientific impact, of the results of the ODP "Atolls and Guyots" Legs in the Central and Western Pacific, the working group also **recommended** that:

- The co-chief scientists of ODP legs 143 and 144 be invited to the next SOPAC annual session to present the results to Member Country Representatives.

Underscoring the 1992 recommendations of Tectonics

Working Group as adopted by STAR, the group further **recommended** that:

- Work relating to the collisional aspects of convergence along the New Hebrides Subduction Zone and initiation of subduction along the Hunter Fracture Zone be strongly encouraged and endorsed.

Report of STAR Ocean Basin Mineral Resources Working Group

The Working Group on Ocean Basin Mineral Resources met twice during the Annual Session in conjunction with the "Seafloor Mapping" group. The group reviewed the situation as regards assessment of offshore manganese nodules, cobalt-rich manganese crusts, and hydrothermal polymetallic sulphide deposits. It reviewed and endorsed the 1994 "Deepsea Minerals" sub-program, and the "Marine Deepsea Minerals Survey" in the SOPAC Medium Term Plan.

The group noted that well-founded preliminary assessments of manganese nodule prospects in the Cook Islands, Kiribati and Tuvalu had been carried out by MMAJ, and that publicity activities in support of prospects in the Cook Islands were well advanced. Additional work for assessment needs to be done in the economic zones of the relatively new members: Marshall Islands and Federated States of Micronesia (FSM). The group strongly supports SOPAC's proposal to MMAJ to carry out work in those areas.

The best prospects for cobalt-rich crusts appear to be in Kiribati, Tuvalu, FSM and the Marshall Islands. Further studies need to be done, including assessments of prospective seamounts, using precise navigation, remote sensing and detailed sampling techniques. Research and assessment work could come from traditional and new supporting countries, and could also be part of the proposed manganese nodule research program in FSM and the Marshall Islands.

As regards polymetallic sulphides, a great deal of geophysical seafloor mapping has given well-defined, well-located targets, and the main need is for detailed assessments of the type carried out by R.V. "Sonne" and "Hakurei Maru No. 2" in the Bismarck Sea. While the prospective back-arc basins are already being studied, the evidence in hand suggests that other areas exist within these basins which require bottom sampling to define their prospectivity. The group encourages supporting institutions to continue such studies.

The group noted that offshore mineral legislation and regulations would encourage exploration by commercial interests and could soon be needed. The group hence encourages member countries to move toward establishing a suitable legal regime for potential commercial exploration.

The group agreed that the continued study of all three types of deep-sea mineral deposits has prospects of economic benefits in the medium to long term and should remain an important SOPAC function.

Research and assessment studies should be encouraged, both to carry out initial assessment of unexplored regions, and to provide initial economic and feasibility information

of limited areas with proven prospectivity. The group stressed the importance of environmental baseline studies, and environmental studies related to mining tests and mining.

The group believes that the necessary detailed mapping of deep-sea mineral deposits is not a primary function of the SOPAC Secretariat but that SOPAC should continue to compile the necessary databases, advise member countries on the results of research and assessment studies, help publicise favourable results, and promote the most favourable prospects.

STAR PROGRAM and ORAL PRESENTATIONS

Saturday, 2 October (at Travelodge - Nadi)

19:30-20:00 Welcoming Address by Chairman of STAR/Keith A.W. Crook

20:00-20:30 Pacific Plate Motions, 0-150 Ma, in the Hotspot Frame of Reference/L.W. Kroenke and C.Y. Yan

20:30-21:00 Evolution of the Lau Basin: Implications for the Geology of Arc-Backarc Systems of the SOPAC Region/James W. Hawkins

21:00-21:30 Early Tertiary Rocks in Fiji/Howard Colley

21:30-22:30 Working Groups

Sunday, 3 October (at Tradewinds - Suva)

19:30-22:00 Working Groups

Monday, 4 October

13:30-14:00 Magnitude and Timing of New Hebrides Arc Rotation Following Spreading Propagation in the North Fiji Basin: Palaeomagnetic Evidence from Nendo, Solomon Islands/Robert J. Musgrave and John V. Firth

14:00-14:20 Cenozoic Compressional Tectonics on the Fairway Ridge and the Lord Howe Rise between New Caledonia and Australia/Yves Lafoy, B. Pelletier and J.-M. Auzende

14:20-14:40 New Constraints on the Permian to Eocene Tectonics of the SW Pacific: Evidence from New Caledonia/Sébastien Meffre, J.C. Aitchison and D. Cluzel

14:40-15:00 Preliminary Estimates of Sedimentation Rates in Modern Convergent Margin-Related Basins in Papua New Guinea/Keith A.W. Crook, Benny Kruman and Gregory Whitmore

15:00-15:30 AFTERNOON TEA

15:30-16:00 Seismotectonics of the Horn Ridge (Futuna and Alofi Islands), a Zone of Convergence in the Fiji Fracture Zone/Marc Regnier

16:00-16:20 Results of Geochemical Exploration of the Seafloor of Papua New Guinea/T. Kuriyama and M. Sakota

16:20-16:40 Operation of a Small Open-Cycle Ocean Thermal Energy Conversion Experimental Facility/Luis A. Vega

16:40-17:00 Volumetric Model of the Monasavu Lake, Fiji /Robert Smith

17:00-17:20 Development of a ROV rock drill/Gary Greene

Tuesday 5 October

08:30-09:00 Assessment of Environmental Impact of Deep Sea Mining: Ecologic Studies of a Manganese Nodule Field in the Peru Basin/U. Von Stackelberg

09:00-09:20 Geothermal Development Potential of the Pacific Island Nations Situated Along the Pacific "Ring of Fire"/Harry Olson

09:20-09:40 Variations in Types of Geothermal System with Geological Setting Around the Pacific Rim/J.V. Lawless

09:40-10:00 Gold Mining at Vatukoula, Viti Levu, Fiji/Rod Jones

10:00-10:30 MORNING TEA

10:30-11:00 The Geology and Mineralisation of the Waisoi Porphyry Copper Deposit, Fiji/Allan Jay

11:00-11:20 Mt Kasi High-Sulphidation Alteration and Gold Mineralization, Vanua Levu, Fiji/G.J. Corbett and G.P. Taylor

11:20-11:40 The Papuan Ultramafic Belt Arc Complex/R. Rogerson, L. Queen and G. Francis

11:40-12:00 Crystalline Basement and Cover Relations in the Amanab Area, Northwestern Papua New Guinea/S. Nion, R. Rogerson, M. Cussen, D. Hilyard, D. Holland, R. Sumaiang, A. Wangu, L. Joseph and D. Loi

12:00-12:20 Utilisation of Remote Sensing and GIS for Energy and Environmental Applications/E. Van Eeckhout and P. Pope

12:20-13:30 LUNCH

13:30-14:00 Results from the Australian-Supported Evaluation of Petroleum Potential in Unfashionable Philippines' Basins: Lessons for Petroleum Exploration in the SOPAC Region?/Chao-Shing Lee, Malcolm C. Galloway and Neville F. Exon

14:00-14:20 Structural Evolution of the Aure Fold Belt, Offshore Papua New Guinea: Implications for Hydrocarbon Potential/Jon A. Rodd, Timothy Buddin and Francis Advent

14:20-14:40 Petroleum Provinces of the Solomon Islands /Bill Barclay

14:40-15:00 Use of Computers in resource Assessment - an Example from Solomon Islands in Hydrocarbon Evaluation/N. Biliki and J.A. Rodd

15:00-15:30 AFTERNOON TEA (sponsored by Emperor Gold Mining Co Ltd)

15:30-16:00 South Pacific Petroleum Survey - a Major New Initiative for Exploration of the Region's Oil and Gas Resources/Jon A. Rodd and Bill Barclay

16:00-16:20 Developing Standards for Measuring Coastal Changes in the South Pacific Region to Assess Vulnerability to Climate Change/Rick Gillie

16:20-16:40 Aggregate Investigations on Small Tropical Limestone Islands/D.R. Tappin

16:40-17:00 Holocene Ocean Surface Temperature Variations in the SW Pacific Derived from Coral Sr/Ca Thermometry/J. Recy, W. Beck, F. Taylor, G. Cabioch, L. Edwards

17:00-17:20 Application of the IPCC Common Methodology for Assessing Coastal Vulnerability to Sea-Level Rise in South Pacific Nations Under the US Support for Country Studies/Rick Gillie

17:20-19:30 DINNER

19:30-22:00 Working Groups

POSTER PRESENTATIONS

The Rifting of the Tonga/Lau Ridge and Formation of the Lau Backarc Basin: The Evidence from Site 840 on the Tonga Ridge/D.R. Tappin

HMR1 Survey of the Western Woodlark Basin, PNG/Brian Taylor, R. Hey, F. Martinez and A. Goodliffe

Results of Leg 2 - SOPACMAPS Cruise/Jean-Marie Auzende

The PACMANUS Hydrothermal Field, Bismarck Sea, Papua New Guinea: an Update/R.A. Binns, S.D. Scott and Shipboard Party

Preliminary Results of SOPACMAPS Cruise (Leg 1)/ Jacques Daniel

Results of Geochemical Exploration of the Seafloor of Papua New Guinea/T. Kuriyama and M. Sakota

Groundwater Resources in Fiji/John Lewis and Prem Kumar

Papua New Guinea Geological and Earth Resources Information System: 'GERIS'/L.D. Queen

Shallow-Water Kuroko-Type Mineralisation in Fiji/D.P. Reddy and H. Colley

Hazards Map of the Circum-Pacific, Southwest Quadrant/R.W. Johnson

Return Periods of Large Earthquakes in Papua New Guinea/I.D. Ripper and H. Letz

Littoral Erosion of the Coral Island of Amedee Lighthouse, New Caledonia, Southwest Pacific/M. Allenbach

Holocene Evolution of the Rewa Delta, Fiji/Jared Armstrong and Graham Shorten

Status of NASA Aircraft Radar Measurements of the South Pacific Region/Donald R. Montgomery

Coastal Erosion Investigations at Yanuca Island and Cuvu Harbour, Fiji/Satish Prasad

Volumetric Model of the Monasavu Lake, Viti Levu, Fiji/Robert Smith

Morphostructural Study of the Southern Ends of New Caledonia and the Loyalty Ridge: Preliminary Results of the ZoNéCo 1 Cruise/G. Pautot, Y. Lafoy, J. Dupont, R. Grandperrin, C. Henin & "L'Atalante" Party.