
THE UNIVERSITY OF THE SOUTH PACIFIC

MARINE STUDIES PROGRAMME

Annual Report
1996

Incorporating the:

Institute of Marine Resources
Ocean Resources Management Programme
Public Marine Education Programme
Pacific Islands Marine Resources Information System (PIMRIS)
Atoll Research Programme
International Ocean Institute Operational Centre
at The University of the South Pacific
and
Dravuni Island Field Station

Compiled by: T. Chamberlain, N. Bulai and G Robin South

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Acknowledgments

We are grateful to the Canadian International Development Agency (CIDA), for continued funding of projects in Marine Studies Programme Development; PIMRIS; Marine Geology and ORMP. Without this significant funding the progress described here would not have been possible. The services provided by Canadian Ocean Resource Associates Inc. in support of these projects is warmly appreciated. We are also grateful for funding from UNDP (IOI-South Pacific) the Government of France, and the Canada Fund, for their support. The University identified Marine Studies for special funding over the period 1994 - 1996; we are highly indebted to USP's member countries who have had the foresight to give special consideration to this programme.

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INTRODUCTION

Marine Studies is an interdisciplinary, university-wide programme, administered by the Professor of Marine Studies in collaboration with the Schools and Institutes, and with the advice of the Marine Studies Advisory Board, whose membership includes representatives from regional and international agencies and donor organizations. The mission of the USP Marine Studies Programme is to:

- **provide the necessary opportunities for Pacific Islanders to understand, conserve, develop, manage and utilize their living and non-living resources in a rapidly changing world**
- **provide Pacific Islanders with the widest possible range of opportunities for research, education, training and employment in the marine sector**
- **provide for improved collaboration between the University of the South Pacific, island nations, regional and international bodies in their common goals in the marine sector**

The following are administered through Marine Studies:

- The Ocean Resources Management Programme
- The Institute of Marine Resources located in Honiara, Solomon Islands
- The Atoll Research Programme (previously the Atoll Research and Development Unit), located in Tarawa, Kiribati
- The Dravuni Island Field Station, Kadavu, Fiji
- The Marine Public Education Programme
- The Pacific Islands Marine Resources Information System (PIMRIS)

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- The International Ocean Institute, South Pacific Regional Operational Centre

Marine Studies also provides support services to all marine-related activities at the University, including the operation of a research vessel and small boats to access to the field, and a dive facility.

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THE MARINE STUDIES PROGRAMME ADVISORY BOARD

Pro Vice Chancellor (Academic) [Chairman]

Coordinator of Marine Studies

Director of Planning & Development

Head of SSED

Head of SPAS

Bursar

Director, SOPAC

Fiji Fisheries Department Representative

Japan International Cooperation Agency Representative

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**LIST OF STAFF
1996**

Marine Studies Programme Core Academic & Administrative Staff

COORDINATOR

G Robin South BSc (Hons) PhD DSc *Liv* FLS
Professor of Marine Studies & Director, IOI-South Pacific

ACADEMIC STAFF

Vina Ram Bidesi BA *USP* MA *Kagoshima*
Lecturer , Ocean Resources Management Programme

Anthony Chamberlain BSc *NSW* GCAS *AMC* MAppSc *AMC*
Lecturer in Post-Harvest Fisheries Technology

Marie Ferland BA *U Mass*, MSc *Rutgers*, PhD *Sydney*
Lecturer in Marine Geology

Johnson Seeto BSc *USP* MSc *Otago*
Lecturer in Fisheries Biology

Joeli Veitayaki BA MA *USP*
Coordinator, Ocean Resources Management Programme

Veikila Vuki BSc *USP* MSc *James Cook* PhD *Southampton*
Lecturer in Oceanography

Jone Maiwelagi
Lecturer in Fisheries Technology

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VISITING FELLOW

Russell Howorth BSc *Southampton* PhD *Vict U Well*
SOPAC

ADMINISTRATIVE STAFF

Umesh Nath	Assistant Project Officer
Nanise Bulai	Secretary
Fulori Liwaiono	Clerk/Typist
Susan Naco	Clerk/Typist, ORMP

Technical & Other Support Staff

Sunia Lavaki	CertMarineEng HigherNatDip <i>UK</i> Chief Technician
Fiu Manueli	Technician & Acting Dive Officer
Shiv Sharma	Technician
Suren Chand	Fisheries Assistant
Vilitati Dawainavesi	Handyman/Cleaner

Research Vessel Crew

Jope Lesavua	Captain & Fisheries Officer
Durwood O'Connor	Engineer
Mahendra Prasad	Asst. Engineer
Samuela Talili	Mate, Halimeda
Netani Tulele	Crew

Dravuni Island Field Station

Marika Lavelawa	Caretaker
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Atoll Research Programme, Tarawa, Kiribati

Temakei Tebano	DipEd, BEd <i>USP</i> MSc <i>James Cook</i> Manager & Fellow
Project Officer	Vacant
Kirata Apisai	Technician
Tekirua Riinga	Ciguatera Project Research Assistant
Mauea Wilson	Voluntary Scheme
Tubeta Taennang	Short Attachment
Faitele Miika	Student Attachment
Kamerea Tekawa	Admin. Clerical/Typist
Etii Teikona	Watchman
Terube Moiwa	Watchman
Tekeuea Beia	Cleaner

Institute of Marine Resources

Johnson Seeto BSc *USP* MSc *Otago*
Director for 1996.

Toata Molea BSc MSc *USP*
Research Fellow

Pacific Islands Marine Resources Information System
(USP Library)

Ganeshan Rao MLS *Br Col* BSc Ed Dip Admin St *USP* Cert Lib Mgmt *Wash*
PIMRIS Coordinator

Ana Jese
PIMRIS Assistant

International Ocean Institute Operational Centre at the University of the South Pacific

G. Robin South BSc (Hons) PhD DSc *Liv* FLS
Director

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Seremaia Tuqiri BA *USP* Dip. Mar. Aff. *Dalhousie*
Coordinator

CROSS-APPOINTED STAFF

PROFESSORS

Viliam Ted Buchwald BSc *Man* MSc PhD *Lond*
Head of Maths & Computing Science, SPAS

Alastair J. McArthur BSc *Strath.* PhD *Nott.*
Head of Physics Dept., SPAS

Peter Newell BSc PhD *Lond*
Head of Biology Dept., SPAS

Subramaniam Sotheeswaran BSc *Cey* PhD DSc *Hull* CChem, FICC
Head of Chemistry Dept., SPAS

Randolph R. Thaman MA UC *Berk* PhD *U.C.L.A.*
Professor of Pacific Biogeography, SSED

Crosbie Walsh DipTech BA *NZ* MA *Well* PhD *Massey*
Head of Development Studies, SSED

READERS/ASSOCIATE PROFESSORS

William Aalbersberg BA *C'nell* PhD *Calif.*
Chemistry Department, SPAS

Kanayathu Koshy MSc *Kerala* PhD *WI* CChem MRSC
Chemistry Department[†], SPAS

Mahendra Kumar BSc *USP* PhD *Nott*
Physics Department, SPAS

Patrick D. Nunn BSc PhD *Lond*
Geography Department, SSED

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SENIOR LECTURERS

Philomena Gangaiya BSc MSc GCEd *USP* PhD *Camb*
Chemistry Department, SPAS

Alison Haynes BSc *Cant* PhD *Open* CBiol MBiol
Biology Department, SPAS

Barbara MacLeod BSc *NSW* PhD *Adel*
Mathematics & Computing Science Dept., SPAS

LECTURERS

Ganeshwar Chand BA MA *USP* PhD *NY*
Economics Department, SSED

Keitapu Maamaatuaiahutapu BSc MSc PhD *Toulouse*
Physics Department, SPAS

Matakite Maata BSc GCEd *USP* MSc *Cant*
Chemistry Department, SPAS

Paul Markham BSc PhD *Lond*
Biology Department, SPAS

Sitiveni Ratuva BA GCEd PGDipSoc *USP*
Sociology Department, SSED

Jane Reinks BSc *James Cook*, PhD *Griff.*
Biology Department, SPAS

Milika Naqasima Sobey BSc PGDipBiol *USP*
Biology Department, SPAS

Sandra Tarte BA *Melb*
History/Politics Department, SSED

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Hilary Todd BSc *Dur.*, DIC PhD *Lond.*
Physics Department, SPAS

Affiliated Academic Staff

South Pacific Applied Geoscience Commission

Fuka Kitei'aho
Assistant Instructor, Certificate of Earth Science and Marine Geology

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MSP POST GRADUATE STUDENTS 1996

Postgraduate students in Marine Studies register with the appropriate school for the MSc, MA & PhD programmes. Following is a list of post-graduate students registered in 1996.

MSc	Jioji Tabudravu	(Graduated)
	Tina Davis	
	John Sulu	(Qualifying)
	Michelle Lam	(Incomplete)
MA	Aliti Vunisea	(Graduated)
	Seremaia Tuqiri	(Part-time)
PhD	Temakei Tebano	(Part-time)
	Joeli Veitayaki	(Part-time)
	Gregory Stone	
	Peter Heathcote	
	Antoine N'Yeurt	

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1996 IN REVIEW

1996 was an other extremely busy year for the Marine Studies Programme. The University continued to give MSP high priority, and this was reflected in the growing level of response that we are receiving from throughout the region, and world-wide. During the year there was also a good spirit of cooperation among all of those staff involved in the programme, and I am most grateful for this. The various sections of MSP are featured separately in this report: here I want to highlight some of the year's events that concerned the overall programme.

The two new undergraduate degree programmes: a BSc majoring in Marine Science, and a BA majoring Marine Affairs began in Semester I. New courses in Post Harvest Fisheries and Seafood were developed and approved for offering in the 1997 academic year.

In June the Government of Japan approved funding for the construction of the MSP facilities on the Laucala Campus. The Fisheries Engineering Company Consultants to the project, finalized the plans and equipment lists and these were approved by the Fiji Government, The University and the Suva City Council by year's end. In December I was invited, with the Permanent Secretary, MAFF to attend the opening of tenders for the construction contract, held in Tokyo. The Kitano Construction Corporation were the successful bidders. Before the end of the year demolition of the old aircraft hanger buildings, home for MSP since 1978, commenced and a busy time was spent in packing up our materials and moving to our temporary quarters nearby.

Mr Johnson Seeto continued until the end of December as Director of the Institute of Marine resources in Honiara has shared facilities with Solomon Islands Fisheries, while the USP's Honiara Centre assisted with administrative and financial arrangements. Plans for the construction of the new IMR building on the Aruligo Site, adjacent to ICLARM, were well under way, although the planned commencement of construction was delayed. Mr Gunnu Pillai, currently Head of SPAS, has agreed to take up the IMR Directorship for a two year term, commencing in April 1997.

In early 1996 a joint USP/JICA Mission visited Kiribati and held discussions with the Government of Kiribati and The Atoll Research Programme on the future development of ARP. A concept paper on the possible establishment of a training centre for fisheries was developed and later approved in principle by the MSP Advisory Board; it was further developed by the USP Tarawa Centre and the Government of Kiribati.

PIMRIS showed an increase in its services during the year; under new arrangements Mr Ganeshan Rao, Coordinator, combined PIMRIS duties with his other responsibilities.

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Publication of MSP Technical Reports has continued, and several new issues were in preparation at year's end. The series is proving an increasingly useful medium for the publication of MSP staff and visitor research reports, reviews and bibliographies.

Our outreach activities expanded during the year. The Marine Public Education Programme combined its efforts with the IOI-South Pacific, The Fiji Dive Operators Association and the Fiji Recompression Chamber Facility in the offering of three Marine Awareness Workshops, at Taveuni, Kadavu and Lautoka.

A workshop on Tuna Jerky production was conducted in Nukefatau, Tuvalu. Marine Science is being built more into the secondary school curricula throughout the region. MSP assisted in conducting a workshop to introduce marine science into secondary schools and also helped in the production of a new unit on marine science in the Fijian Basic Science curriculum.

IOI South Pacific offered the course Management Issues in Environmental and Resource Economics for the second time, and a successful Leaders Seminar was held in Port Moresby, Papua New Guinea.

Cooperation continued to be an important feature of MSP, and among many others we maintained profitable relations with Astrolabe, Inc., the University of Otago, the University of Newcastle, the University of Tokyo and the members of SPOCC. Negotiations continued with the Marine Biotechnology Institute of Japan towards an agreement on an Interim Memorandum of Understanding. MBI conducted a reconnaissance visit to Fiji, and I was hosted to a tour of their headquarters and their research laboratories in Kamaishi and Shizuri. It was agreed that Jioji Tabudravu, Chemistry Department, would be the first trainee to visit MBI, in early 1997.

The MSP Academic staff have been busy during 1996. Dr Veikila Vuki has been hard at work developing an Oceanography course. Dr Timothy Pickering has done a good job filling in for Mr Johnson Seeto. In February, Mr Tony Chamberlain began at MSP, he has developed a seven year plan for the development of post-harvest fisheries and has had two post-harvest fisheries courses approved by the SPAS BOS. Dr Gary Yeo returned to Canada mid-year, we have been greatly indebted to him for his hard work and commitment to MSP. In July, Dr Marie Ferland replaced Dr Yeo as MSP's Marine Geologist and immediately took on the Introductory Earth Science course which has grown considerably since its onset. Ms Sereana Tagivakatini did an admirable job as Coordinator of the Marine Public Education Programme and towards the end of the year has been working on secondment at the Fijian College of Advanced Education to revise the Fijian Grade 7 and 8 National Curricula.

A notable event in 1996 was the successful completion of the first cooperative research cruise on *Koyo-Maru*, with the National Fisheries University of Japan. Many of the MSP

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staff and cross-appointed staff were involved in the 4 day cruise which required a good deal of organisation and planning. Accomplishments of the cruise, which took place at the eastern entrance to the Beqa Channel and off SW Kadavu, included sampling Phyllosoma larvae, collecting CTD data and surveying several seamounts.

During the year we made gradual progress towards the establishment of the UN/DOALOS TRAIN-SEA-COAST Curriculum Development Unit at USP. With support from the UNDP a regional consultative meeting was held prior to the FFC meetings in Tonga, and the necessary regional endorsement for the project was obtained. By year's end the final version of the funding proposal was submitted to the European Commission from the Forum Secretariat.

The year concluded on a high note with the holding of the first MSP retreat at Pacific Harbour. A total of 20 significant recommendations resulted from this highly successful two-day event.

I want to thank the USP Administration, the MSP Coordinators, all of the MSP staff, our many friends from around the world and our donors and supporters for having made 1996 a most significant year for MSP.

G. Robin South
Professor of Marine Studies

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SUMMARY OF PROGRAMMES & ACTIVITIES

INSTITUTE OF MARINE RESOURCES

OVERVIEW

The year 1996 was a dynamic one for the Institute of Marine Resources. The build-up towards the construction of the IMR complex at Aruligo began with the Solomon Island Government approving SBD\$ 1M. USP had prepared the plans for the IMR complex by mid June. Government then purchased the site from the Catholic Church in mid August. Invitation for pre-qualifications for the construction of the IMR was advertised in September and October.

In tandem with the development of the IMR complex, a vigorous research programme was set up. In addition, a concerted effort to promote marine studies at USP was targeted at Solomon Island secondary schools. The dissemination of marine information was also a part of everyday work. We continued to assist our host, Solomon Island Fisheries Department and provided assistance to the USP Centre in return for their services to us. Some new IMR equipment was purchased. However, the majority of the Taiwanese IMR equipment fund remained unspent because it has been ear-marked to equip the new complex.

MISSION STATEMENT of the IMR

The Mission of the Institute of Marine Resources is to serve the peoples of the Pacific Island nations by:

- (a) fostering in them an understanding of the importance of marine resources, both living and non-living;
- (b) fostering in them the principles of conservation and sustainable utilization of marine resources;
- (c) promoting research, education, consultancy and training in the marine sector.

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GOALS of the IMR

The Institute of Marine Resources will carry out its mission by:

- (a) Developing marine resource databases in conjunction with FFA,
- (b) Providing opportunities for technical, professional and in-service training in living and non-living marine resources in collaboration with SPC, SOPAC, and FFA
- (c) Providing expert consultancy services in a range of marine fields including environment impact assessment in support of government, industry and the educational sector;
- (d) providing research and development opportunities in the areas of living and non-living marine resources;
- (e) Strengthening existing and develop new formal and informal linkages with national, regional and international bodies in the marine sector.
- (f) Dissemination of information on all facets of marine resources - their importance, conservation and sustainable management - to school, the general public, governments and agencies of USP member countries.

IMR at ARULIGO

There was no budgetary allocation in the Solomon Island's Ministry of Education and Human Resources Development (MEHRD) budget for IMR in 1996 despite the fact that the IMR was its only priority project. The \$1M funding was obtained by a contingency warrant signed on 10th July. The Solomon Island Government (SIG), however, continues to try to seek outside funding for the IMR. The IMR Plans were completed by the Physical Planning and Facilities Department of the USP on the 19th June, 1996.

The MEHRD appointed Moffat Ramoni in mid July to be Permanent Secretary (Special Affairs) in charge of the IMR Project and to act as a liaison person between the SIG and USP. Gordon Tuza from the Ministry of Works, Transport and Utilities was appointed to supervise the construction phase of the IMR. The

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site was purchased from the Catholic Church for \$100,000 on 19th August, 1996. A marine reserve was proposed for the area below the High Water Mark.

A meeting with ICLARM to discuss power and water sharing arrangements was unsuccessful because they did not have any excess in view of their new developments.

IMR RESEARCH ACTIVITIES, 1996

Johnson Seeto	Fishes of Solomon Islands.	(1654 species to date)
	Fishes of Fiji.	(1754 species to date)
	Cowries of Solomon Islands.	(82 species to date)
	Cone shells of Solomon Islands.	(113 species to date)
	Cowries of Fiji.	(86 species to date)
	Cone shells of Fiji.	(128 species to date)
	Bivalves of Fiji.	(416 species to date)
	Echinoderms of Fiji.	(223 species to date)
	Useful Aquatic Organisms of the SI	(with Toata).
	Dangerous Marine animals of the SI	(with Toata).
	Small booklet on identifying gastropods.	
	EIA of Fisheries backyard (part II)	(with Toata).
	New Fijian anomalopid fish	(with G. D. Johnson, Smithsonian Institution Washington).
	Seasonality of Fijian Marine Organisms.	
Toata Molea	Fish consumption survey and subsistence fisheries of artificial islands of Lau Lagoon, North Malaita, Solomon Islands (with Dr. V. Vuki of MSP).	
	A checklist of fish names in the Lau Language of Lau lagoon, North Malaita, Solomon Islands.	
	Lau Traditional Fisheries Technology.	
John Reuben Sulu	Toxicity of some compounds on fish. The report entitled "Aquatic Toxicity Tests on <i>Poecilia mexicana</i> and <i>Poecilia reticulata</i> : Development of a Regionally Appropriate LC ₅₀ Bioassay For Wastewaters in The South Pacific" will be released as an IAS Technical Report.	

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Investigations into why rural fisheries projects fail in the Solomon Islands.

TEACHING and SUPERVISION

Toata conducted an hour AEPAD Math tutorial every week for SICHE. This arrangement will be terminated next year. He also helped the USP Centre to run BIF02 (Foundation Biology) laboratory classes in Semester One and this arrangement has since ceased.

Johnson gave a 1 hour lecture to the GEPO2 (Preliminary Geography) class on Marine Geography. The informal supervision, by Johnson Seeto, of Michelle Lam's MSc. write-up has been suspended.

CONSULTANCIES

Toata and Johnson started phase 2 of the Environment Impact Assessment of the area behind Fisheries Division Headquarters.

Johnson Seeto did a 2 day consultancy for USP's School of Agriculture, Alafua, Western Samoa to contribute to the publication entitled "Sustainable Primary Production in the South Pacific" for FAO to use as a working paper on the "Technical Consultation of South Pacific Islands Developing States on Sustainable Development in Agriculture, Forestry and Fisheries" in Apia.

An IMR submission was made as part of the MSP response to Andrew Wright's consultancy of SPREP's 1996 to 2000 workplan.

Sue Wikison from Tonga asked for help on the Fishes of Nauru for stamps production.

EVENTS, VISITS, MEETINGS and CONFERENCES attended

Johnson Seeto and Toata Molea attended the Distance Education Conference held at the FFA Conference Room from 17th to 19th April 1996. It was sponsored by SICHE and USP Centre (Honiara).

FAO Technical Consultation of South Pacific Small Island States on Sustainable Development in Agriculture, Forestry and Fisheries held in Apia from 6th to 9th

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May, 1996. Johnson Seeto was invited by FAO (Ror i'e) to be a resource person.

Johnson Seeto represented USP at the Forum Fisheries Committee: Thirtieth Meeting held at the FFA Conference Room, Honiara from 25th to 29th November.

Toata Molea had a 2 week attachment to USP, Fiji from 3rd to 17th February.

Toata visited Lau Lagoon in January and in late August 1996 to do research.

Johnson Seeto went to Fiji from 10th to 25th August for leave and research.

Johnson Seeto attended the Honiara main market ground-breaking ceremony.

PROJECTS and NEW INITIATIVES

Funding for the IMR Grouper Management Project was being reassessed by the EU after new submissions from the Forum Secretariat.

Chris Ireland of the University of Utah requested IMR to sponsor his trip to the Solomon Islands to collect ascidians and sponges. Discussions are continuing.

~~Lori Collins of the Coral Reef Research Foundation in Palau asked for support to collect sponges and ascidians for the National Cancer Institute of USA. We were unable to assist, pending their approval from Fisheries Division.~~

George Zug of the Smithsonian Institution, Washington gave a seminar on turtles and discussed a possible fish collection trip in the Santa Cruz Group in 1998.

David Greenfield of the University of Hawaii wants to work on fish assemblages in Fiji and Solomon Islands.

Southern Cross University Professor Leon Zann wrote a proposal to train Pacific Islanders in assessing coastal fish resources and to develop management strategies.

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Dr Fichez (ORSTOM) discussed a possible joint project on Coastal Pacific Ecosystem: Terrigenous and Anthropogenic Influences.

COOPERATION and HELP

Because of the financial crisis faced by the Solomon Island Fisheries Division, IMR bought mops, brooms and cleaning liquids to help out with cleaning in Fisheries Division. Johnson also helped Fisheries to identify marine organisms, discuss their training needs and funding, develop research proposals (lobster management), philatelic advice for SI stamps and general editing.

Johnson Seeto talked to the SI War Compensation Commission to discuss areas where compensation may be sought especially with regard to damage to the marine environment during World War II.

Toata Molea searched for the shell-less gastropod *Strubellia paradoxa* in the Mataniko River for Dr. Alison Haynes of SPAS, USP.

USP Centre continued to look after our finances and we used their mailbox and fax machine. In return, we provided the Centre with transport to collect the USP mailbag and official trips.

Johnson advised Keith Probert (University of Otago) on Vanessa Craig's Ph.D. proposal to study goatfish in Fiji. Also helped University of Otago students Michelle Boyle, Richard Hamilton and Lesley Raj on their MSc. Projects.

Chris Ramofafia of ICLARM copied Johnson Seeto's thesis on beche-de-mer reproduction.

Murray Chapman (Director, Population Studies Program, University of Hawaii) is compiling a handbook of research expertise for the Solomon Islands Museum to the United Nations. Toata Molea was asked to submit an entry.

Johnson helped Daniel Eta of the SI National Museum to clean, identify and price shells.

Johnson provided a statement to the High Court in a land dispute case, on *Barnea manillensis* (a bivalve), to say that it was not an uncommon shell.

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Toata provided a one page report on the detrimental effects of breaking corals to build artificial islands. This will be used by some landowners of the Lau Lagoon in a court case against some artificial island builders.

Johnson replied to Fiu Manueli's request for information the habitat of the bubble shell *Bulla*.

Johnson sat in on a USP Centre interview panel to fill their accounts clerk position.

Johnson wrote to the Chief manpower planner (Ministry of National Planning and Development, SI) to ask him to include USP's BA (Marine Affairs) in their scholarship allocations for next year.

IMR developed a Sports Club in association with Fisheries Staff.

PUBLIC MARINE EDUCATION

Toata's 1995 interviews on "Our Environment' And "Our Resources" were rebroadcast on SIBC.

~~The Open Day (16th April) at the USP Centre (Honiara), celebrating the USP (SI) Centre's 25th Anniversary, provided the IMR with an opportunity to participate. An aquarium was set up, a warning on the dangers of the cone shells was displayed and a huge poster promoting marine studies at USP was put up. This latter activity led to numerous requests for information.~~

Toata and Johnson visited King George VI Secondary School to talk about marine programmes at USP. This followed a mailing blitz on all secondary schools in the Solomon Islands. As a result, many students came in off the street after reading our notices. There is a demand for the marine courses but students were also looking for scholarship opportunities. We also answered questions on the IOI short courses.

Provided information to newspapers, students and members of the public on various marine subjects. Helped fishers identify marine organisms. Provided information to members of the public about USP marine courses.

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ACKNOWLEDGMENTS

USP (SI) Centre for their help and support.
Steve Roberts of the South Pacific Commission donated 6 training videos.
David Doulman of FAO (Rome) facilitated the donation of over 50 FAO publications to start off the IMR library.

PIMRIS (Nirmala and Ana) provided reprints and library searches to help our research programme and information upon requests from the members of the public.

Richard Winterbottom of the Royal Ontario Museum provided a list of Fiji Fishes.

Ms. Raye Germon of the Smithsonian Institution (Washington) provided a list of Ken Gilchrist's Fiji shell collection.

The Director of the Fiji Museum allowed the examination of the R. W. Brown shell collection.

FFA, ICLARM and National Library for use of their library facilities.
The Ministry of Education and Human Resources Development Staff for their help.

Fisheries Division for being a great host organisation.
Glynn Galo, USP SI Centre Director, for his continued support.

OCEAN RESOURCES MANAGEMENT (ORMP)

The Ocean Resources Management Programme located in SSED is part of USP's Marine Studies Programme.

ORMP offers university degree level courses which are broad based and interdisciplinary. These courses are available to BA and BSc students who will in the course of their career take up decision making and advisory roles in areas relating to marine resource development, management and conservation. ORMP also assists in organising other programmes at USP, and short intensive courses and workshops for in-service personnel in managerial and administrative positions that deal with marine affairs.

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ORMP offers four undergraduate courses MS201, Introduction to Ocean Resources Management, MS203, Fisheries Economics and Management, MS301, Management of Ocean Resources in the South Pacific and MS303, Coastal Fisheries Management and Development. The inter-disciplinary teaching covers relevant and interesting topics in Law of the Sea, Oceanography and non-living resources, marine environment, biological and economic aspects of living resources, national and regional management issues and integrated ocean use. MS201, MS301, and MS203 are also offered through University Extension to allow people in the region to study without moving to Suva. From 1996, students are able to do a BA degree (with double major) in Marine Affairs.

The development of new courses on Law of the Sea and Ocean Policy and Integrated Coastal Management are a priority and would further add to the list of courses for specialisation in the Marine Affairs degree programme.

Two postgraduate courses addressing a wide range of ocean resources management issues are available: MS441 Selected Studies on Regional Management of Marine Resources in the South Pacific and MS442 Selected Studies on the Statutory Management of Marine Living Resources in the South Pacific.

The Marine Studies Programme through the ORMP offers the Certificate in Ocean Resources Management and Policy, Diploma in Ocean Resources Management and Policy and the Diploma in Fisheries Economics and Management, and a BA in Marine Affairs (double major).

Enrolment

In 1995, Semester I the enrolment figures in MS201 were 52 and 31 in MS303. In Semester II, 55 students enrolled in MS301 and 10 in MS203. Enrolment in MS201 through extension was 31 while the number in MS301 was 18 and in MS203.

Activities

In the first semester, Vina prepared course materials for MS203 to be offered through extension in Semester II. She also completed her preliminary study on the

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socio-economic role of Fisherwomen in Ucunivanua and the feasibility of seaweed Cultivation in the Ra Province.

Joeli attended the Annual Session of the Forum Fisheries Committee in Vavau, Tonga as the representative of the university. On his return, Joeli participated in the second Marine Awareness Workshop held at Deuba for the qoliqoli owners from Rewa, Serua and Namosi.

In August, Joeli was given Conference Leave to attend and present a paper at the International Geographical Congress at the Hague. In the following week he joined the other members from the Marine Studies Programme at the Coast Zone Canada 96 Conference in Rimouski, Quebec, Canada. Joeli made a presentation at this meeting.

During the latter half of the 2nd Semester, Joeli was part of a team which included Lisa MacQuiod that revised the MS201 Extension material. Joeli also headed the three Marine Awareness Workshops held in Taveuni, Kadavu and Lautoka between November and December.

EARTH SCIENCE AND MARINE GEOLOGY

Earth Science Teaching

The Earth Science and Marine Geology programmes continued to attract large and increasing student numbers, with a significant number of students coming from the BSc Environmental Science Programme. Dr. Gary Yeo held the Marine Geologist position for the first half of the year and taught all of MS211 Marine Geology and Sedimentology, and MS401 Physical Sedimentology (taught as an advanced reading course). In addition, he contributed to MS111 Introductory Marine Science, MS201 Ocean Resources Management, and SC301 Applied Geology. Dr. Marie Friland took over the position in July 1996, and taught all of SC106 Introductory Earth Science. She also made contributions to MS301 Ocean Resource Management and GE306 Pacific Geoscience, and is co-supervising Oliver Gussmann, a PhD student from Otago University who is working on *Halimeda* in Fiji.

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As mentioned last year, there is a real need for demonstrators to assist in the Earth Science courses, and in SC106 especially, a laboratory course with 43 students for the second year now.

Research Projects

A URC-funded pilot research project was initiated to look at the morphology of fringing reefs and the sedimentology of reef-gap beaches along the southern coast of Viti Levu. The project will be completed in 1997.

A major research effort for Dr. Ferland was coordinating the research cruise of the *Koyo-Maru* in December 1996, as part of a cooperative research arrangement with the National Fisheries University (NFU), Shimonoseki, Japan. The research was a collaboration between MSP, several other departments within the School of Pure and Sciences (USP) and NFU.

POST-HARVEST FISHERIES

Seafoods are important throughout the Pacific region for food security, employment, income generation and as a part of the way of life. There is, however, a surprisingly acute shortage of post-harvest fisheries technical expertise at all levels throughout the region; it has therefore been inevitable that education and training be developed to help meet this shortage.

Post-Harvest Courses

In 1996 USP granted MSP additional funding to assist in the development of new courses in post-harvest fisheries.

Newly appointed MSP staff member, Tony Chamberlain, has been busy throughout 1996 compiling a seven year plan for the development of post-harvest fisheries education and training within the region. Two new seafood credit courses have been approved by the School of Pure and Applied Sciences (SPAS) and the School of Social and Economic Development (SSED) Boards of Studies and will be offered in 1997.

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MS202 Tropical Seafoods will be a core 200 level course in the ORMP programme. This course aims to train individuals in technical and wider areas, to complement training in management aspects through the MSP in the SSED.

MS313 Seafood Science will be an optional 300 level course which can fit into a number of science-based programmes in the SPAS. This course aims to generate a small but essential number of technical and scientific seafood experts in the region.

Research Activities

Post-graduate studies and research in this area have already started to be generated. An MSc project examining the scientific aspects of drying marlin is already well under way. This type of research is being enhanced by collaboration with the Institute of Applied Science (IAS), whose newly appointed Director, Dr Richard Beyer, has considerable expertise in the food industry.

An investigation into the harvesting and post-harvesting aspects of Fijian seagrapes (*nama*) has been undertaken in collaboration with the Food and Agricultural Organisation's South Pacific Aquaculture Development Project Phase II, and the Fijian Ministry of Agriculture, Fisheries and Forests' Fisheries Division. Documentation of traditional practices and trials to determine how to improve the quality of seagrapes for export to Japan have been undertaken.

Other Activities

~~Training in fish spoilage, handling, tuna jerky production, hygiene and product development was provided at an AusAID funded workshop conducted in July 1996 at Nukefatau, Tuvalu.~~

Further regional training activities are being developed through collaboration with the USP's Continuing Education Programme, the Forum Secretariat's Trade and Investment Division, the Canadian Ocean Resources Associates and the South Pacific Commission's Coastal Fisheries Programme.

DRAVUNI ISLAND FIELD STATION

OCCUPANCY/ACTIVITIES 1996

The President of the Astrolabe Incorporated, Joan Koven together with the Littlers (Mark & Diane) and Barret Brooks, from the Smithsonian Institution, continued

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with their Algal Survey from February to March. With a great success in covering more areas, resulting in more findings earlier in the year, they are now retaining their booking to this period.

Gert Worheide and three other fellow Scientist from the Institut und Museum für Geologie und Palaontologie, Universität Göttingen, Germany spent 10 days from March 18th. Their activities involved a reef cave expedition collecting Coraline Sponges, Lithistid Sponges from reefs and Rock Substrates from habitats. The specimens were then exported back to Germany.

Three teams from Earthwatch, coordinated by Dr Denis Goulet of University of Buffalo stayed for six weeks altogether from June to August. Activities very similar to the past using about sites off one of the passages to observe the reef progress or regress growth using Butterfly fish as markers.

In November Dr Kunii from the Research Centre for Coastal Lagoon Environments, Shimane University, Japan, coordinated for the Seagrass project team. This trip was for 10 days.

Vanessa Craig, a postgraduate student from Otago University was at the Suva campus for about six weeks on pilot a trip to establish whether or not is feasible to carry out a Goat Fish study. Suva lagoon and the adjacent coastal area have obviously been "fished out" and the logical step was to survey the Astrolabe lagoon with two other divers for about 4 days at the end of November.

From the end of November to early December, Dr Tomoki Kase and 4 other colleagues from the National Science Museum, Tokyo, spent 10 days at the station. Their activities involved collecting marine specimens including microscopic molluscs, various other organisms and rock substrates. Most of these specimens are collected from reef caves and are to be exported back to Japan.

Ashwin Reddy, a Physics Post graduate assistant of the USP has a solar powered transmitter at the station. He had this installed about a year ago and now he had finished with his project and the transmitter has been retrieved.

Dr Norman Quinn a Fulbright Scholar, visited the station about 5 times during the year observing the effect/result of some lobster larvae traps he deployed at the beginning of the year.

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DEVELOPMENTS

The dive compressor which originally had a Honda petrol engine has now been replaced with a Yanmar diesel engine. Experts have suggested the change because of consistent break-downs in the Honda.

Thanks again to the President of the Astrolabe Incorporated for sourcing out more funds to develop and expand the accommodation area at the station. A six room wooden building is scheduled to be constructed at a new site in early 1997. Pressure from having this available fund, support from Maciu (a prominent village elder) and the patient coordination of Capt Jone Maiwelagi have enabled us to secure a formal lease for 75 years. The land includes the current station "block" and a new one about 20 metres away. With a total area of about 500 square metres at F\$200.00 per year lease and great environment, a lot in marine studies and research should be achieved from this.

BOAT SUPPORT, 1996

APHAREUS

The research vessel Aphareus was basically idle for the whole year because of the engine problem it sustained in 1995. There was a lot of delay because of the spare parts not being available in Suva which had to be ordered from Australia. ~~Even then, there were other minor "hitches" like cooling water pump and turbocharger problem.~~ After about ten hours of "trial run", the first "offshore" trip was made at the end of August to pick up the Earth Watch group from Dravuni. The engine again developed some problem just before they were "abeam" Solo light house.

The Insurance Assessor confirmed that the problem was the Clutch/Reduction Gear Box and it was again given to South Seas Engineers to repair it. At the moment of this report no progress has been made because they are awaiting the parts from Australia.

HALIMEDA

Propeller "bushing" problems continue to affect the Halimeda operation despite renovation done to the transom. The engineering staff are carrying out another modification to the vessel with the hope of overcoming the slippage problem.

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PUNTS

With The Marine Studies Programme playing similar roles to schools, being directly responsible to its MS courses, there was more intense use of punts. It became obvious in this year's boat operation that the existing punts are becoming inadequate. We now require larger and more durable ones because the size we have now tend to require at least two for a one class field trip.

The two regular punts have also sustained a lot of damages because they are Fibreglass and are incapable of enduring the wear and tear they have been experiencing.

The Earthwatch coordinator Dr Goulet, kindly donated a "high bow" 25 footer fibreglass punt with a 40 hp Yamaha outboard motor. With regard to size, it is more ideal than the older ones. Renovation have been carried out by one of the engineers mounting bench seats athwartships and dive tank racks in between. This punt has a seating space for up to 16 students. Apart from the Earth Watch usage, the last four teams to Dravuni have also enjoyed its availability.

PROPOSAL

The inefficiency of the punt support experienced this year led to some serious discussion on the issue of acquiring new punts of higher capabilities and durability. After some informative and successful discussions with the major punt users, the resolution was to try and purchase at least 2 Aluminium punt with a capability of ferrying 16 students each, by the beginning of the 1st semester in '97.

INFORMATION SERVICES:

Pacific Islands Marine Resources Information System (PIMRIS) Coordination Unit

INTRODUCTION

PIMRIS based at the University of the South Pacific Library, has achieved the major objective of establishing a Regional Coordination Unit. The Unit has the objectives of coordinating a regional plan for an organized collection, bibliographic recording, and dissemination of fisheries and marine information to the Pacific

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Island Countries. Through a sub-project (Outreach Project) PIMRIS has been providing assistance to island countries within the South Pacific region in marine information management. The development of a regional database on marine resources is another major objectives of PIMRIS.

The PIMRIS Coordination Unit Project commenced in early 1989 and the PIMRIS Outreach Project started in 1990. 1996 saw the formal completion of the sub-project, however, technical assistance to the island countries will continue as needed. The funding has been provided by the Canadian International Development Agency (CIDA) through the executing agent, Canadian Ocean Resources Associates (CORA)

This report covers both the projects: PIMRIS Coordination Unit and PIMRIS Outreach.

HIGHLIGHTS

Regional Cooperation

The participation of regional organisations: South Pacific Commission (SPC), South Pacific Applied Geosciences Commission (SOPAC), Forum Fisheries Agency (FFA), South Pacific Regional Environmental Programme (SPREP), and The University of the South Pacific (USP), in marine information dissemination and sharing has been excellent.

Regional Communication

Electronic Mail: It is really a great advantage, as of this year, that all the regional organisations cooperating in PIMRIS are on Electronic Mail communication. Hence, a number of discussions and information requests are delivered easily.

PEACESAT: A number of Pacific Island countries' fisheries departments as well as FFA and SPC(Noumea) have PEACESAT ground stations. While the PIMRIS Coordination Unit is able to use PEACESAT communication channels via Fiji Fisheries Division or SPC (Suva) Stations via phone patch mechanism very

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conveniently. Hence there has been a significant reduction in long distance communication costs

International Cooperation

PIMRIS Coordination Unit at USP has been successful in establishing contacts and agreements with numerous institutions outside the region in the field of marine information. The new one in 1996 was Scripps Institute of Oceanography Library's discussion on a pilot project for document delivery over internet. This will enable PIMRIS to receive documents and share information at no or minimum costs. Discussions will continue during 1996.

PIMRIS' Participation in International Databases

Discussions with FAO on PIMRIS becoming an input centre for Aquatic Sciences & Fisheries Abstracts(ASFA) are on hold due to staffing situation at PIMRIS. So is the case with discussions with National Information Services Corporation (NISC - USA) for PIMRIS to contribute electronic records in exchange for CD Databases.

VII Pacific Inter-Science Congress 1997 of the Pacific Science Association (PSA)

USP will be the host of this Congress in July 1997. A request from the President of PSA was made to the President of IAMSLIC (International Association of Aquatic & Marine Science Libraries & Information Centres) for IAMSLIC's participation in the Congress. Since PIMRIS is recognised as the South Pacific Regional Group of IAMSLIC, the request was forwarded to the PIMRIS Coordination Unit. Discussions were held with the Chairperson of the Session on Marine Resources for the Congress. PIMRIS will present a display as a part of the Session.

Collection Development

The regional organisations cooperating in the PIMRIS Network have been very regular in depositing copies of their publications with the Coordination Unit. USP's School of Pure and Applied Sciences' *'South Pacific Journal of Natural Sciences'*, Marine Studies Programme's *'MSP Technical Report Series'*, and the *'Fisheries*

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Research Bulletin of Tonga have been added to the list of PIMRIS publications that are used for exchange arrangements with international institutions

Efforts have continued at identifying, acquiring and processing all materials on marine resources in the South Pacific with the aim of building up a strong marine collection to support and enhance the information services PIMRIS has been continuously soliciting people and organizations to deposit documents on marine resources, specific to the Pacific region, with USP Library. During 1996 **260** items were obtained from PIMRIS contacts.

Library Instructions

Library lectures were conducted for science students of the University on the usage of scientific indexes and abstracts. These included : Biological Abstracts, and Chemical Abstracts. The lectures were organised in liaison with the USP science lecturers and the Reader Services Librarian of the USP Library. The sessions proved to be very successful.

Special bibliographic instructional lectures were conducted for the students of Ocean Resources Management Programme. Literature searching skills and database availability were discussed.

Specific demonstrations were given to individuals as well as groups of students in searching electronic databases including CD-ROMs.

Publications

A project on publishing a selected list of Ocean Resources Management Programme(ORMP) student research papers has been initiated. The papers have been organised by the ORMP staff and will be edited and technical production work done by USP Library staff. The production is expected to be complete in early 1997 with USP Marine Studies Programme providing the funds for printing.

PIMRIS DATABASE DEVELOPMENT

Some editorial work on quality control has continued during the period of reporting. A new set of records have been received from SOPAC. PNG is in the process of sending an update of their latest records. More records are expected from the cooperating institutions and countries before some more work can proceed in the release of further updates of this database.

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It is anticipated that selected specialised subject bibliographies can be generated from this database.

STAFFING

Positions

Up until March 1996 there were two full-time and one part-time staff in PIMRIS. Ganeshan Rao (PIMRIS Coordinator) and Nirmala Gounder (PIMRIS Library Assistant) were working full-time. Ana Dakunivosa (Clerk-Typist) is being shared by other departments within the Library.

Due to a staffing situation at the University Library, the professional positions were reviewed to allow for coverage of all departments within the Library. Hence, as of March 1996, the PIMRIS Coordination Unit has been staffed with a half-time professional position for the Coordinator (Ganeshan - also being the Acting Serials' Librarian); Nirmala continuing as the full-time PIMRIS Assistant with Ana still as per the previous arrangement.

The Coordinator's position is therefore being funded through the Library's core funding while the PIMRIS Assistant continues to receive funding from the Project budget. The Clerk-Typist's position is also funded from the Library as was from the beginning of PIMRIS.

~~Although it is anticipated that a full-time professional position for the PIMRIS Coordinator will be provided, the current arrangement also serves as a trial for long term planning. It is becoming more evident that there is an essential need to have a full-time professional position to enable an effective and efficient service in PIMRIS.~~

Ganeshan was on special leave without pay overseas from mid July till mid December 1996. Meanwhile, the University Librarian (Mrs Esther Williams) assumed the administrative responsibility of PIMRIS on a part-time basis. Mrs Williams was also the Acting PIMRIS Coordinator from mid 1990-mid 1991. Ganeshan still maintained close communication with the PIMRIS Coordination Unit via electronic mail.

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Training

The PIMRIS clerk-typist attended a vocational training course in 'Advanced Word Perfect' while the PIMRIS Assistant received special on-job training on the use of electronic mail for international communication.

The PIMRIS Coordinator received specific training at the University Computer Centre on use of TELNET, LYNX, and NETSCAPE facilities to access remote information sources via internet.

The University of the South Pacific, under the Australian International Development Programme (IDP) funding assistance, sponsored the PIMRIS Coordinator for an attachment and understudy visit to the Commonwealth Scientific & Industrial Research Organisation's (CSIRO) Information Services Branch (Melbourne) and the Fisheries Division (Hobart), Australia. The visit was from 4-13 January 1996. The visit also enabled establishing contacts in CSIRO as well as other institutions in Melbourne. Acknowledgement is expressed to the IDP and USP for the sponsorship.

INFORMATION SERVICES

Information services continued throughout this period.

Regular Products & Services

- i) PIMRIS Newsletter (Quarterly)
Vol 7 Nos. 1,2,3 & 4.
- ii) Current contents awareness service for 132 periodical titles held by USP(114) and SOPAC (18)(Monthly). SPC has forwarded its serial titles list to the Coordination Unit and some titles will be included.
- iii) Recent publications list (Monthly)
- iv) PIMRIS Information packages

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Information Product Distribution

	1996
PIMRIS Newsletter	399
Current Contents	
No. of Titles available:	132
Distribution:	40
Recent Acquisitions List	66

Information Requests

PIMRIS products and promotion have resulted in the growth of information services to users in the region.

	1994	1996	
Reference Requests:	508	709	increase of 39.6%

The requests for information include both quick reference and research type reference questions as well as literature searches.

<u>Type of User</u>		<u>1996</u>		<u>1994</u>	
Fisheries Officers	=	129	18%	102	20%
Researchers	=	86	12%	56	11%
USP Staff	=	133	19%	77	15%
USP Students	=	155	22%	134	26%
Govt. Officers	=	52	7%	10	2%
Librarians (from Reg. Organisation also)	=	83	12%	74	15%
Others (business, embassies etc)	=	57	8%	55	11%
TOTAL		<u>709</u>		<u>508</u>	

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Categories of Users (based on Info. requests)

		<u>1996</u>		<u>1994</u>	
Pacific Is Region	=	596	84.1%	450	88.6%
Outside the Region	=	113	15.9%	58	11.4%

PIMRIS OUTREACH

Country Assistance and Other Technical Assistance

Fisheries/Marine Resource Division Libraries in the region (a total of 14 countries) have received technical assistance in information management. Installation of the CDS/ISIS software and PIMRIS database system; and varying levels of training have been provided. In all cases the library workers received lessons on the CDS/ISIS software including data-entry, searching and printing facilities. Instruction in basic cataloguing, library organisation and information management was also provided.

During 1996 a number of countries and two institutions were given different forms of assistance.

Solomon Islands

The PIMRIS Coordinator visited Solomon Islands from 20-27 January to provide technical assistance to Forum Fisheries Agency (FFA), Solomon Islands Fisheries Department and the International Centre for Living Aquatic Resources Management (ICLARM) - Solomons. The visit was sponsored by the FFA, with a very minor component from PIMRIS.

Solomon Island's Fisheries Department and USP Centre (Solomons)

A review session was held with the library staff on library management and database maintenance. The Department had already received detailed technical assistance from PIMRIS staff in previous years so this visit enabled a follow-up. Some technical improvements were made to the database set-up (on CDS/ISIS) with more training to the staff.

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Forum Fisheries Agency

A basic training workshop was held in CDS/ISIS database management software. The training was to introduce the concept of information management; define a system and database development and its significance in information access. Technical details associated with database development; data entry; storage; indexing; printing; data export/import; and information retrieval using CDS/ISIS were taught.

ICLARM Aquaculture Research Centre (Solomons)

A session on database creation using CDS/ISIS was conducted at the Centre. Since the staff had attended the Workshop at FFA it was easier to develop a library database system for local use. ICLARM's headquarters library (Philippines) has a reciprocal arrangement with PIMRIS on information exchange.

Fiji

The Fisheries Division, Ministry of Agriculture, Fisheries and Forests, is in the process of filling the full-time position of its Library/Information Assistant. PIMRIS has offered to provide technical training to enable the Division to resume its library services which have been at a very low level since the departure of previous staff.

The Division launched the "1996 Year of the Turtle" on 28 March to which the PIMRIS Coordinator was invited to attend. The year-long campaign to conserve sea turtles was officially launched by the Minister for Agriculture, Fisheries and Forests.

Papua New Guinea

The PNG Department of Fisheries & Marine Resources (DFMR) is reported to be going through a review process. It will be setting up an Information & Publication Division to sustain and strengthen the work done by PIMRIS in PNG. The DFMR Librarian is currently on a seconded assignment with the SPC Fisheries Information Unit in New Caledonia for 1996. The experience gained will be of great benefit to DFMR. It is hoped that the local marine information network initiated during PIMRIS outreach visits will be strengthened through setting up of the new Information Division in DFMR.

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Discussions have been held with the DFMR Librarian regarding plans for the production of the 'PNG Fisheries Bibliography'. Considerable amount of work has been done between PIMRIS and PNG to set up a database for this purpose. PNG fisheries will send the final set of electronic record to PIMRIS where the editorial & technical work will be performed.

Nauru

A new set of PIMRIS database structure disks with instructions were sent to the Fisheries Section for installation and use. The FFA Information Officer visited Nauru to provide technical assistance in fisheries information management. The visit was planned in consultation with the PIMRIS Coordination Unit.

Western Samoa, Tuvalu, & Kiribati

The library/information staff from these countries' fisheries departments are performing their duties satisfactorily after their training attachment at PIMRIS/USP Library in December 1994/January 1996.

Palau

A set of references (in electronic format) from the first edition of Palau Fisheries Bibliography has been received. The Bibliography Update project will continue in 1996 upon receipt of more updated reference list.

Palau & Federated States of Micronesia (FSM)

Jean-Paul Gaudechoux, Fisheries Information Officer visited these two countries and briefed the PIMRIS Coordinator on the status of marine information management. It was felt that there was a need for some in-country technical assistance during 1996 which PIMRIS could provide (as provided to some other Pacific island countries in the past). SPC will follow up with Palau and FSM regarding the funding of such assistance.

Collection Development for National Centres

Efforts at improving the national Fisheries Divisions library collections continued. Although items were delivered during 1996, no new orders were placed and in

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view of the anticipated formal winding up of the Outreach project all pending long overdue orders were canceled by the middle of this year .

FUTURE STRATEGIES & FUNDING

1. Internal Assistance

It has been noted that the services from the PIMRIS Coordination Unit is benefitting MSP significantly. Almost 41% of the information requests are from the USP staff and students. In view of this and the benefit provided to the region, the University Library and Marine Studies Programme have jointly worked on some strategies.

a. Short Term

The PIMRIS projects' completion date was 31 August 1996. Upon receipt of confirmation from CIDA/CORA, the Marine Studies Project Coordinators proposed a re-allocation of any surplus funds from all sub-projects according to MSP's priorities. The proposal was approved during discussions between the USP and CIDA/CORA. The PIMRIS Outreach Project formally ended on 31st August 1996 with final narrative & financial reporting to be completed at the end of the 1996. The PIMRIS Coordination Unit project was extended until 31st December 1996 with additional funding allocations

It is noted that the Library is providing a half-time Coordinator (note the comments under the subheading **Staffing-Positions** above) and a half-time Clerk-Typist from its core budget leaving only the Library Assistant's position and the operational costs to be funded under the Project.

b. Long Term

The Library has incorporated one Assistant Librarian (AL) (Marine Studies), one full-time and one part-time Library Assistant (Marine Studies) positions in its 1997-1999 triennial budget for USP's core funding. It has been indicated that this proposal will receive strong support from MSP during the triennium discussions. MSP plans to provide the operational costs to facilitate the activities of marine

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information services. This was included in MSP's submission to the University for the same triennium core funding.

c. MSP - Marine Studies Information Centre (MSIC)

In the new MSP complex the MSIC will be based. It has been agreed to place PIMRIS' operations at the MSIC which will be staffed by the positions mentioned in part (b) above.

2. External Assistance

In view of the strong regional support for the continuation of PIMRIS services, funding in-part for the marine information services will be incorporated as part of a USP's Marine Studies funding proposal which will be submitted to CIDA for its assistance under the C-SPODP II funding cycle.

CONCLUSION

PIMRIS has identified Information Services and Products, and Database Development as its core activities. However, technical assistance and information management training will be provided based upon expressed needs. An attempt is being made to let the core activities of PIMRIS be maintained in view of the marine information needs of USP's Marine Studies Programme and the Pacific islands region. The regional mandate of PIMRIS cannot be dissociated from the PIMRIS Network as that was the fundamental rationale behind the setting up of this System.

PIMRIS Coordination Unit acknowledges the funding support of Canadian International Development Agency. It also acknowledges the support of the USP Marine Studies Programme.

PUBLIC MARINE EDUCATION

This report covers the period January-July 1996 and highlights the main activities that the programme was involved with.

A. WORKSHOPS

1. Kiribati: Headteachers Workshop-January 11-15

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I was invited to follow up on an earlier visit to Kiribati on the STD/AIDS Programme and to address primary headteachers during their annual in-service week. I also used the opportunity to explore with them the possibility of introducing and infusing ideas of marine awareness in their schools.

Visits were also paid to:

- the Coordinator of the Atoll Research Programme to discuss ways in which we could collaborate in marine education.
- the Tarawa Teachers College to discuss how marine education could be infused into the revisions that were being carried out in their preservice courses.

2. Papua New Guinea: In-service Workshop for Teachers March 11-15

I was invited to be guest speaker and resource person for the PNG In-service workshop for Marine Educators from 11-15 March 1996. The workshop was the first ever marine education workshop held in PNG and was the culmination of efforts by Mrs Bernadette Aihi of the Curriculum Development Unit. She had attended the 1994 and 1995 Public Marine Education workshops in Suva and conducted the conference as follow up to these workshops.

~~It was encouraging to witness the collaboration between personnel of the different subject areas in the Curriculum Development Unit of the Ministry of Education as well as cooperation from the University of PNG and the Department of Environment and Conservation. The workshop was attended by teachers from all levels in the formal school system.~~

Several recommendations worth noting were made at the workshop:

- The new reform curriculum which was being developed at the time of the workshop should reflect the urgent need for marine education and the conservation of the environment and natural resources of PNG.
- Marine education and conservation of other resources should be made a national priority. Support for this should be effected in the school curriculum,

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at teacher training colleges and at university level. Collaboration between governmental and non-government agencies should also be encouraged.

- Further in-service work at provincial levels should be promoted so that more teachers can have a role to play in marine education.

3. Marine Awareness Workshop for the Beqa Lagoon: May 16-18

The second marine awareness workshop for divers and dive operators, villagers and traditional fisheries rights owners around the Beqa Lagoon was held at the Pacific Harbour International Hotel from May 16-18 1996.

The Public Marine Education programme has a support role in its organisation and these included:

1. attending planning meetings
2. translating papers into vernacular language to enhance readability and understanding of workshop documents
3. identifying resources to be used in the workshop
4. organising accommodation for participants
5. being a resource person for the workshop

The workshop was a success in its outreach to the Beqa Lagoon communities. The development of knowledge and skills by the participants would be critical in assisting them to make important decisions regarding their fisheries and activities that they carried out.

Many key persons from relevant departments and organisations were also invited to share information about policies affecting the fisheries in the Beqa Lagoon and to discuss on issues raised by participants.

Further workshops in other parts of Fiji is planned to follow.

4. SPREP Curriculum Development Workshop on Population and Environment for the Micronesian Island States: Palau June 10 - 24

I coordinated the above workshop on a consultancy basis for IOE. This involved developing a curriculum for years 7-10 to take into account the commonalities and

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the differences in situations of the Micronesian islands. This necessitated the inclusion of a host of relevant marine issues and possible ways of resolving them.

5. Public Marine Education Regional Workshop: July 8 - 12

The third Public Marine Education Regional Workshop was held from 8 - 12 July 1996. Invitations were sent out to the following countries: Cook Islands, Fiji, Kiribati, Marshall Islands, Nauru, Niue, Palau, Papua New Guinea, Solomon Islands, Tokelau, Tonga, Tuvalu, Western Samoa and Vanuatu.

A highlight of the workshop was the launching of the Marine Science Series which was produced at the James Cook University under the sponsorship of AUSAID and UNESCO. Workshop sessions included the identification of special features of the publication and training the participants in the use of the books. Many participants found the sessions on classroom based activities that could be carried out easily in local settings to be beneficial.

Follow up on the 1996 workshop is likely to include training the trainer sessions on the use of the Marine Science Series in the classroom. To date at least one country is liaising with SOPAC and James Cook University in providing this in-country training.

The continuation of the Public Marine Education Programme was seen to be an important agenda for all member countries to coordinate activities for the region. ~~Countries were also urged to take appropriate steps to formalise the inclusion/infusion of marine education into the formal curriculum at all levels of the school system.~~ Teacher training and relevant material remained at the top of the list of needs for the region for effective marine education.

B. NETWORKING

Important new and continued contact with officer(s) made during the year included:

1. Magnum Bergstrom, Fisheries Training Officer at SPC/Noumea
2. Litea Vadiga, former PME assistant and Naturalist at Cousteau's Resort/Savusavu
3. Bernard Huon-Dumentat, Humanitarian Action International/Suva

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4. Professor James Hopley, Director of Fisheries Centre at James Cook University/Queensland
5. Dr Aung Than, Education Officer, Sea Level Monitoring Project/Australia
6. Peter Hunnam, Director WWF/Suva
7. Russell Howorth and Lala Bukarau, SOPAC/Suva

C. COMMITTEES

The PME was represented on the following committees:

1. Turtle Workgroup Committee/Department of Environment
2. Ecowoman/SPACHEE
3. Advisory Group on Environment Issues/USP

D. PRESENTATIONS

Lectures were delivered on the following topics:

1. Coral Reefs at the Fiji College of Advanced Education for Science pre-service teacher trainees
2. Marine Awareness in the Community for the Women and Environment Workshop/YWCA, Suva

GENERAL COMMENT

A shortcoming of the programme in 1996 was the non-realisation of two important items of the 1995-1996 plan of action. These were namely the lack of publications and the non-response from several countries approached for in-country workshops to produce local or translated material in marine education. The lack of teaching material had been identified as a major constraint in efforts to enhance marine education in the school system.

I would suggest that more effort be made in lobbying for inclusion of marine education in the formal school curriculum. Support activities could include materials production and in-service training to develop knowledge and skills of teachers to effectively implement marine education.

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ATOLL RESEARCH PROGRAMME, Tarawa, Kiribati

ONGOING PROJECTS

Ciguatera Fish Poisoning. (by Tekirua Riinga). The 3 year project is in its final year. Several drawbacks were encountered during the implementation of the project. One of the most critical problems is the closure of a testing unit at Deception Bay, Brisbane, Australia, which ARP had been working closely with in the bioassay of potentially toxic fish materials. ARP could not assist financially to keep the unit functional as it would require at least \$40,000 per annum. The testing kits (named poke test) initially developed by the University of Hawaii of which the patent was sold to Chemtech in the USA mainland had been temporarily put off market. These kits were planned to be purchased by ARP for preliminary testing and as a backup to the Brisbane based testing unit. The project itself lack of funding to initiate its own testing unit, therefore, the project had been concentrating on the identification of toxic fish species, potentially toxic reefs and the trends in the ciguatoxin population. Despite these unexpected problems, progress reports for South Tarawa and Christmas Island have been completed and sent to Marine Studies USP for publication.

The last round of sampling for South Tarawa and Christmas is underway. The trip to Christmas is being constantly delayed due to flight difficulties.'

***Te bun*, *Anadara* sp. biology, ecology study.** (by Temakei Tebano) The writing up of the report on the project is underway. *Te bun* data, shell length, sex, gonad stage etc., collected from various islands in the Kiribati group are being analysed.

Flying fish species identification based on traditional knowledge. The projects is continuing at a slow pace. Fishing mainly by gillnetting before sunset is carried out during times when the fish is most abundant. When the fish is scarce though, less fishing pressure is applied. Data for the past 3 years are being analysed and compiled into a report. This is carried out by staff on a voluntary scheme and a student from KGV and EBS on attachment with ARP.

Environmental Study. A brochure jointly funded by the Ministry of Education Training and Technology and ARP for Environmental Education study was

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designed at Atoll Research. The brochure is awaiting approval by both parties concerned before printing proceeds.

Chicken egg production at a village level. The project is in its 3rd year. Several chicken batches have been successfully reared on a diet of mixed imported feed with local, mainly grated coconut, leftover fish meat and grass. Egg production is the same if not greater than chickens fed with imported feed only. The project is a self-funding one with cash obtained from sale of eggs is used to purchase more imported feed, coconuts and fish.

Lagoon Fish. Data for some lagoon species of Tarawa atoll are being collected. The project was initiated at the end of last year as a follow up from the Tarawa Lagoon Project. Not much data were collected due to various technical problems including the unwillingness of fishermen to cooperate. The project is now being revitalised and moving at a fast pace. One of ARP's skiffs is now used by volunteer fishermen. The scheme is similar to the flying fish project. Some of the target species include *Lutjanus bohar*, *Lutjanus gibbus*, *Adioryx spinifer*, *Monotaxis grandoculis*, *Lethrinus ramak*, and more. This study will concentrate on length-frequency and gonadal stage with the hope that the data will be useful in the conservation and management of the fisheries.

WORKSHOPS/MEETINGS

GIS Remote Sensing User Group Meeting The first Kiribati GIS user group meeting was held at the Ministry of Home Affairs board room. Several representatives from different government bodies including Atoll Research Programme were invited to this meeting. The meeting was conducted by Frank Martin from SOPAC as part of the TIPPS project. The Ciguatera Project Research Officer attended the meeting.

Train the Trainers workshop. A workshop which focused on training key personnel from different sectors/departments on conservation and sustainable development of the resource was held at the USP maneaba, Teoraereke. The workshop spanned 2 days from 29-30th October and attracted key people from several government and non government bodies. Present were representatives from Te Mautari Ltd. (the local commercial fishing company), Atoll Seaweed, the Kiribati Chamber of Commerce and Ministry of Natural Resources including Fisheries Division. The workshop was coordinated by Craig Wilson from SPREP and Temakei Tebano from ARP.

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Maurin Kiribati Association Meeting. The Maurin Kiribati or Traditional Healers Association Working Committee had been holding its monthly meetings at ARP maneaba. Mr Temakei Tebano attended the meetings being one of the advisers to the association. A brochure for Maurin Kiribati Association was designed at ARP. The brochure contains background information on the said association, its members and objectives.

North Tarawa Conservation Area training. The Manager, Mr Temakei Tebano, Mr Bwere Eritaia from MESD (Ministry of Environment and Social Development), and Mr Kirata Apisai, mechanic for ARP visited North Tarawa headquarter on Thursday the 24th of October. The purpose of the trip was to train the resident on tree/plant sampling survey to be used for a village inventory list on the rare and endangered trees and plants. They left in the morning and returned early afternoon. This is the second trip for the project for this year.

Coastal Zone Canada '96 Conference. (August 6) The Manager left for Canada to attend the Coastal Zone Canada '96 Conference where he jointly presented a paper on the biology, ecology and conservation of the bivalve, *Anadara sp.*, locally known as *te bun* with Prof. Robin South. He spent about a week in Canada and Fiji before returning on the 22nd of August.

Year of the Coral Reef Meeting. The Manager/Fellow, Mr Temakei Tebano attended the meeting held at the Tanoa International Hotel, Nadi, from 8-12th of July.

National Chemical Profile meeting held at Ministry of Environment and Social Development board room. The meeting was hosted by Mr Munro from SPREP and Mr Tauleia from MESD. The Ciguatera Project Research Assistant attended the one-day meeting which introduces the aims and objectives of the National Chemical Profile Committee.

TRAINING

Beach Profiling Training held at Naa, islet in North Tarawa was attended by Project Research Assistant. The training took 2 days and was conducted by Jim Maragos, a consultant for MESD. Present were representatives from Fisheries Division, Natural Resources Development, Environment Unit and ARP.

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Nauru Visit. Mr Temakei Tebano left for Nauru, an island nation in the central Pacific on the 16 of July. He was invited by Fisheries Department of the government of Nauru to help formulate fisheries projects mainly on reef fish conservation and management.

Open Water Scuba Diving Course(May 24th) Three staff from ARP attended the training. The theory part of the training was held at ARP maneaba. The course was offered by Mr James Uan, a NAUI dive instructor working for Fisheries Division of the Ministry of Natural Resources. The project was written by ARP and funded by the Forum Secretariat.

Map Info[™] Training Workshop. The Ciguatera Project Research Assistant attended the 5-day workshop held at the Tarawa Technical Institute (TTI) Betio. The aim of the workshop was to introduce the participants to the theory and practical application of the software. Several participants from government and non-government organisations were present including Lands and Survey Division, Ministry of Environment and Social Development, Fisheries Division, and staff of TTI.

The workshop was officially closed by the Secretary to Ministry of Home Affairs and Rural Developments, Mr Mikaere Baraniko. Participants were presented with a certificate of attendance at the end of the workshop.

Voluntary Scheme. Ms Mauea Wilson worked for ARP under the voluntary scheme. She finished her term by the end of the year.

St. Joseph's College Students. Two form five students, Mr Tunee Teburea and Ms Burebo Kaurii from St Joseph's College, did a 2 weeks attachment with Atoll Research. This is part of the School Work Experience to enable students to experience a working environment in government and non-government organisations. The students were introduced to scientific data collection involving surveys, computer inputting and analysing of the data. They also had a chance to be briefed on the theory of SCUBA diving which is used frequently at ARP.

KGV & EBS Student: Mr Tererei Anro, a form 7 student, spent his two-week mid year vacation doing a project with ARP. The project involves a survey of the local food supermarket at Bairiki and Bikenibeu to obtain the price of locally available foods sold at the markets. The project will compare the price of the

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local foods with its equivalent imported food. The results for the survey have been published.

Ms Fajtele Miika, a form 6 student at KGV/EBS started her attachment with ARP on Monday 18th of November. She is expected to finish mid January 1997.

Mr Tubeta Taenang, a student of Tropical Fisheries is also on attachment contract with ARP. The contract is due to end mid January 1997. Both Mr Taenang and Ms Miika are trained on various aspects of scientific data collection and analysis.

INTERNATIONAL OCEAN INSTITUTE OPERATIONAL CENTRE

The second half of the year proved to be a very busy period for IOI-South Pacific. This was also the first year for the organisation to run independent of GEF funding. The major activities carried out in 1996 were as follows:

1. Conferences

Coastal Zone Canada '96 (August 11-17): This was held at the Universite du Quebec a Rimouski in Quebec. It was attended by Prof. Robin South, Joeli Veitayaki, Temakei Tebano and Seremaia Tuqiri. Three papers were presented, a joint paper by Tebano/South, with the other two being individual presentations by Veitayaki and Tuqiri.

2. Seminars

Leaders Seminar (September 26): This was a one-day seminar held in Port Moresby aimed at senior Government personnel and focussed on the topic, "Integrated Ocean Management: Issues for Papua New Guinea."

3. Courses

Management Issues in Environmental & Resource Economics (October 21 - November 22): Offered for the second time and taught by the Department of Economics with assistance from the Computer Centre, the course attracted a total of 11 participants from the South Pacific, South-east Asia and Africa. The Course

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is expected to be offered twice in 1997, the second by request from the Government of the Marshall Islands to be held in Majuro.

Management & Development of Coastal Fisheries (deferred): This course was supposed to run concurrently with the Resource Economics course, however there were certain developments that necessitated the deferment of the course to 1997.

4. Workshops

Marine Awareness Workshops (May 16-18, November 26-28, December 3-5, December 10-12): This was a series of four workshops held in the following centres: Pacific Harbour, Deuba covering the provinces of Rewa, Serua, and Namosi focussing on Beqa Lagoon; Somosomo, Taveuni covering eastern Vanua Levu, Qamea, Matagi and Laucala; Tavuki, Kadavu for the province of Kadavu; and Lautoka covering the western provinces of Ba, Ra, and Nadroga. The general aim of these workshops was to create an awareness on the importance of marine conservation particularly the fragility of the marine ecosystem, as well as an attempt to bring together resource users and custodians to discuss issues of common concern.

Funding for the Beqa Lagoon Workshop was provided by the Government of France while the success of the latter three was due mainly to the financial support from the Government of Canada. ~~A regional workshop is planned for 1997 to be held in Suva with financial support from the Canada Fund.~~

5. International World Commission on the Oceans (IWCO)

Last year a number of hearings were conducted around the region including New Zealand for the Independent World Commission on the Oceans, a lead up to the International Year of the Oceans in 1998. A Report on the hearings has been published. A second publication will include a compilation of papers written by a number of authors from around the South Pacific region including Australia and New Zealand.

Apart from the hearings, the University Region is also involved through the representation of USP Vice Chancellor Esekia Solofa in the international high level committee of the IWCO. He has already participated in two of its meetings held in Amsterdam, The Netherlands and Rio de Janeiro, Brazil.

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APPENDIX 1

List of Publications by USP Staff or
from work done under the auspices of
MSP
(USP Staff are listed in **BOLD**)

PUBLICATIONS

Anro, T. Market price of some selected local food items: *A comparative survey of South Tarawa food markets.*

Atherton, J., Martel, F., **Clarke, W.** and **Thaman, R.** 1996. *Guidelines for the collection & development of baseline data in conservation areas.* South Pacific Biodiversity Conservation Programme, Apia. 96pp.

Bidesi, V.R., Veitayaki, J. E. Matthews and A. Ballou. 1996. Preliminary Baseline Survey of Marine Resources of Kaba Point, Fiji. Technical Report 96/1. Marine Studies, USP, Suva, 65pp.

Bidesi, V.R. 1996. MS203: Fisheries Economics and Management: Introduction and Assignments and Materials. University Extension.

Haynes, A. 1996. Reproductive strategies in the freshwater genus *Septaria* (Neritidae). Molluscan Reproduction volume of Malacological Review, Suppl. 6: 1-7.

IOI-South Pacific, 1996. Marine Awareness Report - Beqa Lagoon.

Karaiti, Rev. B. Aia Borau I-Tungaru (*Navigation of I-Tungaru*) 43pp. in Gilbertese.

Karaiti, Rev. B., Cati, Dr. A., Taurii, A. and Tebano, T. Akawa ni Kiribati (Makoro 3). *Te Tia Kibe (Reef Torch Fishing)*. In Gilbertese.

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Koshy, K. Chloride interference in the IF determination of dissolved organic carbon in seawater. Accepted for publication in the 5th Eurasia Conference on Chemical Sciences, Canton, China, Dec. 10-14, 1996.

Kubuabola, S. & Naqasima-Sobey, M. (1996) Environment assessment of the proposed area for the expansion of Natovi Jetty. IAS Environmental Report No 84, USP, Suva.

Lowery, R. 1996. Should Redclaw Crayfish be introduced to Fiji? Pacific Conservation Biology 2 : News and Views.

Lum, J., Yeo, G., Molea, T. and Mani, L. (1996) Metapono Report. *SOPAC Technical report.*

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Molea, T. 1996. A Checklist of fish names in the Lau Language of Lau Lagoon, North Malaita, Solomon Islands. *IMR Technical Report 96/1.* 16 pp.

Naqasima-Sobey, M. 1996. The Application of the Line Intercept Transect (LIT) Technique to Coral Reef Monitoring in Fiji. Proceedings of the 8th International Coral Reef Symposium, Panama 24-29 June 1996.

Naqasima, MR. 1996. An investigation of public health and fisheries issues concerning *Anadara antiquata* (Mollusca, Bivalvia : Arcidae) and *Batissa violacea* (Bivalvia : Corbiculacea). MSc Thesis, USP, Suva.

Newell, P.F., J. Clavier and J. Riley 1996. The biodiversity of the invertebrate faunas of the soft sediments from the Great Astrolabe Reef (Kadavu Group, Fiji) and Tarawa (Kiribati) lagoons in the South Pacific. p. 237-245 In Turner, I.M., C.H. Diong, S.S. L. Lim, & P.K.L. Ng. (eds.) Biodiversity and the dynamics of ecosystems. DIWPA Series Volume 1. 383 pp.

Newell, P.F., J. Clavier and Riley, J. 1996. Comparisons between the benthic community structure of two tropical lagoons. Proceedings of the 8th International Coral Reef Symposium, Panama 24-29 June 1996

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Newell, P.F. and J Clavier, 1996. Quantitative structure of soft substrate macrobenthos of Fiji's Great Astrolabe Lagoon. Proceedings of the 8th International Coral Reef Symposium, Panama 24-29 June 1996.

Nunn, P.D. 1996. Emerged shorelines of the Lau Islands. Fiji Mineral Resources Department, Memoir 4, 99pp (28 figures, 8 plates, 9 tables).

Nunn, P.D. 1996. Geomorphological evidence of climate change in the Pacific. In: Aung, T. (editor). Proceedings of the Ocean & Atmosphere Pacific International Conference. Adelaide: National Tidal Facility, The Flinders University of South Australia, 265-275. (4 figures).

Nunn, P.D., Aalbersberg, W., Clarke, W.C., Korovolavula, I., Mimura, N., Ohno, E., Yamada, K., Serizawa, M. and Nishioka, S. 1996. Coastal Vulnerability and Resilience in Fiji: assessment of climate change impacts and adaptation, Phase IV. Apia, Western Samoa: South Pacific Regional Environment Programme, 215p. (11 figures, 23 tables).

N'Yeurt, A.D.R., McClatchey, W.C., and Schmidt, H. 1996. A Bibliography of Rotuma. MSP Technical Report 96/2. 131pp.

N'Yeurt, A.D.R. and South, G.R. 1996. Biodiversity and biogeography of benthic marine algae in the Southwest Pacific, with specific reference to Rotuma and Fiji. Pacific Science.

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Raj-Prasad, A and South, G.R. 1996. *S. Pacific J. Nat. Science* 14.

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Schneider, W., Einsel, N., Paulsen, T. and Wuertz, J. 1996. Bio-Sedimentological Studies Across the Bligh Water, in the Eastern North Fiji Basin and Along the Yasawa Platform, Fiji. MSP Technical Report 96/3.

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Tebano, T., Riinga, T. Teaioro, I. Ciguatera Fish Poisoning PROGRESS REPORT: Dinoflagellate density and Ciguatera incidence on Christmas and Fanning Islands, Linnix Group. KIRIBATI.

Thaman, R.R. 1996. The biodiversity of Koroyanitu National Park. *Domodomo: A scholarly journal of the Fiji Museum.* 10 (1): 28-51.

Thaman, R.R. 1996. Distant fields: The relevance of field studies for distance education in the Pacific Islands. In Ravaga, V., Vatucawaqa, L., Hola, L., Faasalaina, T. and Singh, V. (eds.), *Negotiating the distance: A collection of experiences in teaching extension courses at The University of the South Pacific (Celebrating 25 years of distance education at The University of the South Pacific)*. University Extension, The University of the South Pacific, Suva. Pp. 125-142.

Thaman, R.R. and Whistler, W.A. 1996. *A review of uses and status of trees and forests in land-use systems in Samoa, Tonga, Kiribati and Tuvalu with recommendations for future action.* Working Paper 5, June 1996 (RAS/92/361). South Pacific Forestry Development Programme, Suva. 171pp.

Thaman, R.R. and Wilton, R. 1996. *GE 304 Resource Conservation and Management: A Basis for Sustainable Development.* Course components: 1) Introduction and Assignments booklet, 2) Study Guide with terms and concepts, general notes on weekly topics, past in-semester tests and final exams, and 3) two volumes of supplementary readings containing 24 additional readings, summaries of readings, terms and concepts and study questions. Extension

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Pasifika: Published by the International Ocean Institute Operational Centre at USP.

PIMRIS Newsletter: Published by the PIMRIS Coordination Unit, USP Library.

Pacific Ocean Voice: Published by the Marine Public Education Programme.

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APPENDIX II
Visitors to Marine Studies
1996

Laucala Campus

February:

Toata Molea	IMR, Honiara, Solomon Island
Robert Authur	USP Extension Course, Kiribati

March:

Kelvin Passfield	Tuvalu Fish Drying Project
Jon Cook	SCP Fisheries Consultants
Seiichi Ohta	NEDO Tokyo, Japan
Taichiro Kawase	MBI, Tokyo, Japan
H. Tanaka	FAO Aquaculture
S. Roberts	SPC
Toachim Reitner	JMGP Göttingen, Germany
Dorothea Hause-Reitner	JMGP Göttingen, Germany
Gert Wörheide	JMGP Göttingen, Germany
Karen Diele	JMGP Göttingen, Germany
Helmat Lehnert	JMGP Göttingen, Germany
Norman Quinn	Biology Dept, USP

April:

Jim Anderson	MRAG, London
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May:

Stella Maris Vallejo	United Nations, TSC
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Dubus Francis	U F P
Bonneville Alick	U F P-CUPF Papeete
Pascal Perron	French Embassy, Suva
David L Dobbin	Canadian Ocean Resources Assoc.
Vanessa Craig	University of Otago, Dunedin
Keith Probert	University of Otago, Dunedin

July:

Dr Henry Kaspar	Cawthron Institute, NZ
-----------------	------------------------

August:

Ryu Omae	Pacific International Ltd
----------	---------------------------

September:

Yuki Yoshida	UNDP
Isao Inouye	University of Tsukuba
Toshihiro Yokochi	Nat. Institute of Bioscience and Human Tech.
Yoshikazu Shizuri	Marine Biotech. Institute
Taichiro Kawase	Marine Biotech. Institute

October:

Masaru Okuno	JICA
Yoshiki Okai	Min. of Foreign Affairs, Japan
Shanji Tozuka	JICA
Kenji Okamura	OAFIC, Team of JICA
Hiroshi Takeuchi	Min. of Agriculture Forestry & Fisheries, Japan

November:

Yashushi Inaba	JICA
Tomoki Kase	National Science Museum, Tokyo
Lt. Jone Soro	Fiji Navy

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December

Luke Ratuvuki Permanent Secretary, MAFF
Peniasi Kunatuba Deputy Secretary, MAFF

Institute of Marine Resources

John Reuben Sulu MSP student

Florian Gubon Ph.D. Candidate from Cambridge University

Paddy Ryan Free-lance Photographer

Vili Fuavao FAO Sub-Regional Director for the SW Pacific

Robin South Coordinator, MSP & Professor of Marine Studies

Colin Hunt Australian National University

Barerei Onorio OFCF

Trevor Sankey Scientific Advisor of UNESCO

Ranjit Singh Auditor

Filipe Viala &
Siosifa Fukofuka SPC Scientific Observers

Ambrose Or'ahana SICHE, Lecturer in the School of Marine &
Fisheries

Ian Banner USP, Director of Physical Planning & Facilities

Cema Bolabola Head, Continuing Education Unit, University
Extension

Gunnu Pillai Head of SPAS, USP

Richard Hamilton University of Otago (MSc Student)

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Paul Kausimae School of Humanities, USP

Mr Shunji Totsuka JICA

Captain Kenji Okamura (OAFIC)

George Zug Smithsonian Institution

Atoll Research Programme

Mr Kisione Finau Computer Centre, USP

Joeli Veitayaki &
Tim Pickering Marine Studies Programme, USP

Diane Goodwillie Canada Fund Coordinator, Fiji

Craig Wilson South Pacific Commission

Tarawa Teachers College (TTC) Students

Riyad Mistry Environment Unit, Majuro, Marshall Islands

Ruth Marsha TAP (formerly TIPPS)