

SOPAC

ANNUAL REPORT SUMMARY

2006



Pacific Islands Applied Geoscience Commission

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Director's Foreword

Cristelle Pratt

This annual report summary provides a snapshot of key actions that the SOPAC Secretariat accomplished in the reporting period September 2005 to September 2006, as well as providing a synopsis of the issues and opportunities within the areas of our technical competence that we believe need to be considered and addressed.

I mentioned in my annual report to the 35th Session of our Governing Council held in Honiara, Solomon Islands that our focus in the immediate and medium term must be on implementation as we support our member countries to meet the various commitments that they have made at international and regional levels. The *Mauritius Strategy for the Further Implementation of the Barbados Programme of Action for the Sustainable Development of Small island Developing States*, the *Pacific Plan* and the *SOPAC Strategic Plan 2005 – 2009* continue to provide the strategic guidance in how

we programme and deliver the services into our member countries through our three technical programmes of Ocean and Islands; Community Lifelines and Community Risk.

With respect to the key priorities identified by the *Pacific Plan*, under its *Kalibobo Roadmap*, SOPAC has and continues to concentrate on supporting a number of key initiatives that fall firmly within its remit. For example, the implementation of the *Pacific Islands Energy Policy* and related Strategic Action Plan and the *Pacific Disaster Risk Reduction and Disaster Management Framework* comprise a large proportion of our work programme and both regional policies have been expressed by our political leaders as requiring immediate attention.

I am sure that few will disagree that energy security and disaster risk management

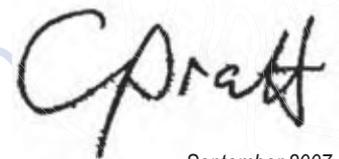
"We continue to recognise the need to link the use of science and management to protect natural resources together with a sound policy framework that reaches from the regional level right down to the local level to ensure those most in need benefit from our scientific and technical work." SOPAC Director, Cristelle Pratt

are key development issues for all of the countries and territories in our region. They are imperatives for sustainable development and absolutely critical if we are to address the challenge of economic development and growth. In addition there are important security as well as governance dimensions that need to be considered as we address these challenges.

Without the partnerships that we have developed, as well as the new and exciting partnerships that we continue to form, with a multitude of national, regional and international organisations and agencies we would not be in a position to celebrate the momentum at which SOPAC is delivering and achieving results. Again I am pleased to present flagship examples of our genuine commitment to the principles of partnerships as facilitator of the *Pacific Regional Disaster Risk Management*

Partnership Network, established in February 2006, and the ever strengthening *Pacific Water Partnership* that continues to implement the *Pacific Regional Action Plan on Sustainable Water Management* and other key regional policies related to water and sanitation.

I am extremely fortunate to be at the helm of an organisation made up of extremely skilled and dedicated professionals who understand their important roles and responsibilities to our member countries. Over the past twelve months we have strived to work at all levels to ensure that we are and that we continue to support actions and initiatives for which we can demonstrate a comparative technical advantage and that serve our membership to work toward achieving the development outcomes that they aspire to.



C. Pratt

September 2007

Introduction

To develop natural resources, principally non-living resources, in a sustainable manner and to strengthen the resilience of Pacific peoples.

SOPAC in 2006

Since its inception in 1972, SOPAC has expanded considerably to become a leading regional organisation in the provision of technical support to Pacific member countries to help them achieve and maintain their economic and social potential.

SOPAC is committed to sustainable development through capacity building and works to reduce poverty and strengthen resilience in the Pacific by supporting the development of natural resources, in particular non-living resources. SOPAC work investigates natural systems and the management of vulnerability through applied environmental geosciences, appropriate technologies, knowledge management, technical and policy advice, human resource development and advocacy of important Pacific issues.

SOPAC provides support, guidance and advice to member countries in three programme areas: Ocean and Islands; Community Lifelines; and Community Risk.

The Ocean and Islands Programme is committed to improving technical knowledge of ocean and island ecosystems for the sustainable management of natural resources through: resource use solutions; monitoring physical and chemical change in ecosystems; and natural resources governance.

The Community Lifelines Programme aims to improve and strengthen community access to energy, water and sanitation, information and communication technologies through: resource assessment, development and management; asset management; and governance and advocacy.

The Community Risk Programme aims to build safer communities through improved disaster risk management practices by strengthening resilience to disasters; mitigating the effects of hazards; and mainstreaming disaster risk management.

Programme areas are supported by Corporate Services that provide an information technology unit, publication and library services, and offers technical and field assistance.

Currently the SOPAC member countries are: Australia, Cook Islands, Federated States of Micronesia, Fiji Islands, Guam, Kiribati, Marshall Islands, Nauru, New Zealand, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu. American Samoa, French Polynesia, New Caledonia and Tokelau are associate members.

Who funds SOPAC?

SOPAC is funded by member country contributions and supported by the following donors: the Asian Development Bank (ADB), Australia (including the Australian Centre for International Agricultural Research (ACIAR), the Australian Marine Science and Technology Limited (AMSAT), the Australian Volunteers International (AVI) and Emergency Management of Australia (EMA)), the Centre for Agricultural and Rural Cooperation (CTA), the Commonwealth Secretariat, Denmark, the European Union, Fiji Islands, France, Japan (including the Japan Water Forum), New Zealand, Office of US Foreign Disaster Assistance, Taiwan/ROC, United Kingdom and various UN agencies (inclusive of the Global Environment Facility and the World Bank).

KEY WORK PROGRAMMES



Ocean and Islands

To improve technical knowledge of ocean and island ecosystems for the sustainable management of natural resources.



Community Lifelines

Improved community access to energy, water and sanitation, and information and communication technologies for sustainable livelihoods.



Community Risk

To improve disaster risk management practices to build safer and more resilient communities.

Background

SOPAC, through the Ocean and Islands Programme (OIP), is committed to working with governments, organisations and communities in the Pacific to ensure sustainable and better living through improved resource assessment and management of ocean and island resources.

Summary of Key Activities

Resource Use Solutions

© Updating and maintenance of the Pacific Islands Regional Maritime Boundary Information System (PIRMBIS) continued. PIRMBIS contains baseline information from maps, and satellite imagery, as well as the computed critical base points, and the extrapolated notional maritime boundaries for Tokelau, American Samoa, Fiji, Vanuatu, Republic of the Marshall Islands, Federated States of Micronesia, Palau, Tuvalu, Kiribati, Cook Islands, Niue and Nauru. The archipelagic straight baselines (ASBs) have been validated for Fiji and Vanuatu. Existing treaties have also been incorporated into PIRMBIS, and median lines computed for

the neighboring countries of Tokelau and American Samoa.

© Technical reports outlining the status of maritime boundaries data for Tuvalu, Niue and Cook Islands were completed and validated by Geoscience Australia after the 34th Annual Session. A sub-regional technical training workshop on the use of PIRMBIS and field survey methods was conducted for the Federated States of Micronesia, Kiribati, Marshall Islands and Palau in May 2006. A similar workshop was also planned for Vanuatu, Solomon Islands and Papua New Guinea.

© The recent agreement between Marshall Islands and Palau on their respective maritime boundaries is a positive step forwards in helping countries secure greater maritime wealth.

© Analysis and reporting on geophysical surveys (2005) of major rivers on Viti Levu: the Rewa, Navua and the Sigatoka Rivers. The processed data, GIS, map and information products were provided to the responsible authority enabling assessment of impacts of dredging and sedimentation for each river, with recommendations for future planning and management decisions.



Deploying sidescan sonar, for mapping seabed, Nabouwalu, Fiji.

"We can use SOPAC to help us improve the lives of our citizens." Deputy Prime Minister of the Solomon Islands, Mr Job Dudley Tausinga

- © The Benefit-Cost Analysis (BCA) of aggregate mining on Majuro Atoll, Marshall Islands was completed and a stakeholder workshop convened in Majuro to discuss the findings and recommendations.
- © Transcription of data (re-mastering and transcribing of tapes) from the SOPAC Petroleum Databank at Geoscience Australia continued and is nearing completion. After the quality checking of the remastered 3590 tapes, the original 9-tracks will be destroyed. Additionally, all maps and reports held in the databank are being digitised. It is anticipated that the full digital and hard copy collection will be returned to SOPAC by the end of the year. All country information will be made available to countries on CD and also held at SOPAC in the Ocean Information System.
- © Under a co-operative agreement between SOPAC and KIGAM, a programme of fieldwork on the island of Savai'i in Samoa, lagoon resource assessment and coastal morphology mapping was completed and the report finalised and made available.
- © A workshop on the assessment, use and management of marine aggregates in the Pacific was held in Suva in February 2006. This was in collaboration with the Circum-Pacific Council for Energy and Mineral Resources and with funding from the Government of Taiwan. Support for aggregate investigations

within Papua New Guinea, Solomon Islands, Samoa, Vanuatu and Kiribati was provided by the Aggregates Adviser under the EDF Project, Reducing Vulnerability of Pacific ACP States.

- © A major capacity building initiative has commenced with the Fiji Hydrographic Unit in multibeam mapping for generating new charts for navigation in the Yasawa Islands. This previously uncharted region is now the focus of increased tourism and vessel traffic and the development of baseline bathymetric data is crucial to navigation and the characterisation of potential benthic habitats which in turn underpins information needs for sustainable resource management.

Monitoring Physical and Chemical Change in Ecosystems

- © An MOU was signed with the Bureau of Meteorology Australia to continue SOPAC's engagement with the South Pacific Sea Level and Climate Monitoring Project for Phase IV of the project. BoMET replaced AMSAT as project manager. Geodetic and cGPS surveys as well as maintenance and calibration of SEAFRAME sites were completed for all beneficiary States. Phase IV will run until December 2009. A SOPAC-based regional Communications and



SOPAC Project officer, Andrick Lal setting up a GPS base station, Majuro.

Pacific States have opportunity to secure potential maritime wealth

Pacific States have an opportunity to secure potential greater ocean wealth that may include gold, silver, oil and gas.

Assessments conducted by SOPAC have identified strong grounds for some Pacific countries to extend sovereignty over their continental shelves.

SOPAC Director Cristelle Pratt said securing greater maritime sovereignty can provide increased revenue for Pacific States and deliver significant economic and social benefits from access to ocean resources that occur on the seabed and within the subsoil. "These Pacific Island Countries recognise that determining the boundaries of their Exclusive Economic Zone beyond 200

nautical miles is critical to securing exclusive ocean development of potentially rich non-living resources, such as oil, gas, gold and silver, as well as living organisms that live on and beneath the seabed," Ms Pratt said.

Submissions to claim an extended continental shelf must be based upon sound technical data and meet requirements prescribed within Article 76 of the United Nations Convention on the Law of the Sea 1982 (UNCLOS), to secure an extended Continental Shelf beyond the 200 nautical mile exclusive economic zone.

"Considerable political, legal and technical efforts will be needed and SOPAC will work closely with Pacific Governments and various development partners including AusAID, Geoscience Australia, Ireland, Japan, France, UN agencies, the Commonwealth Secretariat, and Pacific Regional Organisations," Ms Pratt said.



Sidescan sonar paper recorder.

Coordination Adviser was recruited and a regional communications strategy would be developed to improve dissemination of products from climate-related projects at regional, national and sub-national levels. This component of the Project captures the regional need for appropriate and scientifically sound information delivery at a regional and national level and was designed to enhance understanding of climate change science and build national capacity for adaptation responses.

- © Major bathymetric surveys were undertaken during this reporting period, mainly to provide information to improve navigation safety. This information would also assist decision making for other resource use solutions such as mitigating effects of coastal erosion, sedimentation and geological hazards. This important work will enable governments to better protect local communities from natural threats. Major multibeam bathymetric surveys undertaken included:
 - Cook Islands: Avatiu, Avarua and Avana harbours (Rarotonga) and Arutanga harbour on Aitutaki Atoll.

- Fiji: Yasawa Islands region, New Kinoya Outfall – Laucala Bay.
- Federated States of Micronesia: Pohnpei State Kolonia, Sokehs, Matanim and Rokiti harbours.
- Papua New Guinea: Lae Harbour and environs, Sissano, Madang.
- Republic of Marshall Islands: Majuro atoll and environs.

© Implementation of the PI-GOOS Work Plan for 2006-2007 continued, and a review and update of the 2001 Strategic Plan was undertaken. The PI-GOOS Coordinator was active in developing partnerships throughout the Pacific region and internationally to further promote and develop the regional alliance. Activities included re-activation of the PI-GOOS Advisory Committee to provide guidance for the development of data products that were requested by member countries, such as ENSO indices for the tropical western Pacific by the Vanuatu Meteorological Service.

© Key PI-GOOS activities included the promotion and further development of the SEREAD ocean science education initiative for primary and secondary schools throughout Fiji. The initiative is having a real impact in helping to raise student and community awareness of important ocean resources. A more formal strategy is expected to be introduced into the curriculum throughout the Pacific region between 2006 and 2009.

PI-GOOS was instrumental in raising community awareness of ocean issues. Activities included a media campaign on World Ocean Day (June 8) and through the initiation of a PI-GOOS website. An ocean data server, designed to increase access to ocean information held at SOPAC, was secured in late 2006 thanks to generous support from the International Pacific Research Centre (IPRC) in Hawaii.

"SOPAC has proved its merits. SOPAC can never satisfy every country's needs but with technical and financial support, they have been very useful and help us with the impact of scientific progress. Without SOPAC we would not know so much about some things regarding our natural resources, including water, natural disasters and our main priority area of ocean and islands." Dr Sione Nailasikau Halatuituia, Deputy Secretary Ministry of Lands, Tonga

Ocean Governance

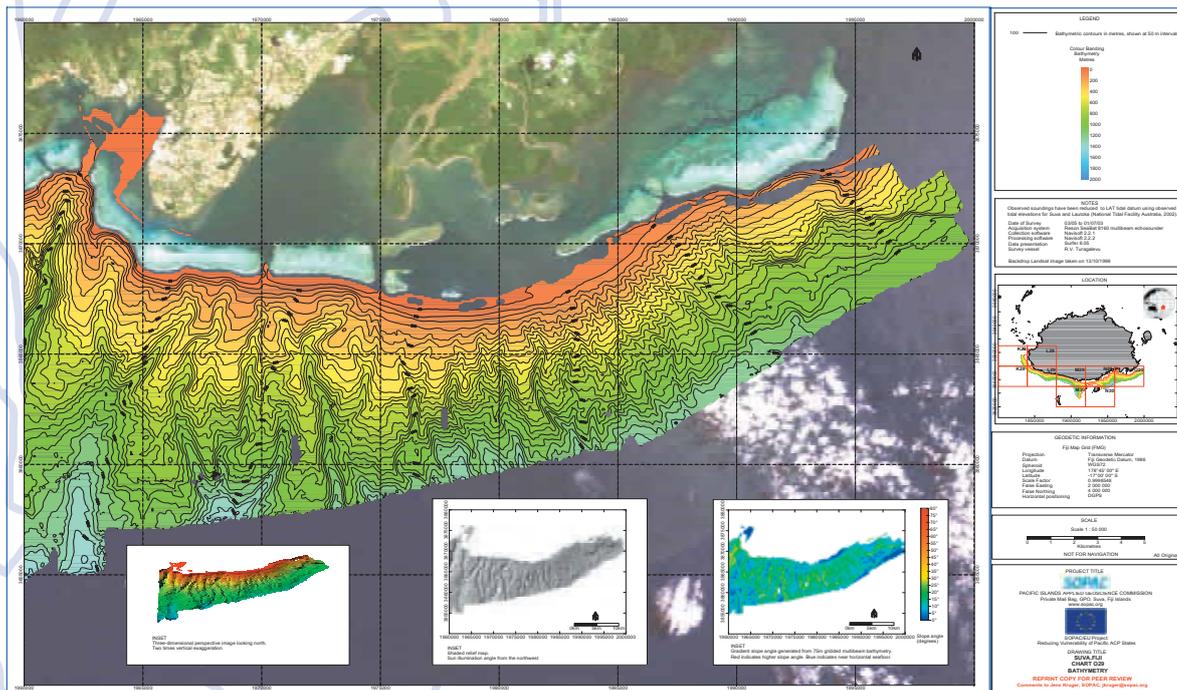
- ⊙ Work on assisting with maritime boundary delimitation continued along with PIRMBIS development and associated training.
- ⊙ SOPAC conducted a joint SOPAC-ComSec regional workshop on maritime boundaries negotiations, with participation of legal, policy and technical professionals from Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Republic of Marshall Islands, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu.
- ⊙ Commissioned the services of the National Oceanographic Centre (NOC) in the United Kingdom to undertake desktop assessments for a number of Pacific coastal states to further determine potential to claim extensions of continental shelves beyond 200 nautical miles. A high-level meeting with relevant countries would be held to discuss study findings and possible funding and future SOPAC support for the submissions phase.
- Support was provided to the Fiji Government for a desktop assessment being undertaken with the assistance of the Commonwealth Secretariat.
- SOPAC work in the area of extended continental shelf is in conjunction with the Commonwealth Secretariat, UNEP-GRID ARENDAL (Norway) and Geoscience Australia.

- ⊙ Continued involvement with the CROP Marine Sector Working Group, in particular -with further implementation of the Pacific Regional Oceans Policy and Framework for Integrated Strategic Action (PIROP-ISA). SOPAC sourced funding through the Global Oceans Forum/GEF to facilitate activities in relation to development or national ocean policies and/or “mainstreaming” the PIROP-ISA in development planning at the national level.
- ⊙ A Senior Governance Adviser – Natural Resources, was recruited to SOPAC in March 2006 to provide guidance on important economic issues to help member countries make more informed decisions about natural resource management.
- ⊙ The OIP Manager provided support to countries during the annual session of the UN Informal Consultative Process on the Law of the Sea (UNICPOLOS) in New York and also briefed NY PIC Missions on a range of regional initiatives.

Issues and Opportunities

Resource Use Solutions

1) SOPAC Petroleum Databank and related databases— The SOPAC Petroleum Databank is currently housed at Geoscience Australia (GA) in Canberra. Much of the data covering the seabed areas of Fiji, Tonga, Vanuatu and the Solomon



Bathymetry map of Southeast Viti Levu, incorporating recently acquired multibeam data.



Sediment sampling using a VanderVeen grab.

Islands was gathered in the 1980s under SOPAC auspices by a tripartite programme involving USA, Australia and New Zealand and under individual Oil Exploration Licenses by petroleum exploration companies. The SOPAC Petroleum Data Bank (P-DB) is a critical information source for countries and potential petroleum exploration company partners.

In order to avoid loss of data through deterioration of original tapes, data within the P-DB is being transcribed on to more robust media. Approximately 1500 seismic tapes was being remastered and 200 reports and 300 maps scanned and digitised and made available on DVD's with an overview of petroleum prospects in the region. This would make storage and management easier as well as making it cheaper for interested companies/persons/organisations to obtain the data. As GA now faces space constraints, all material, including the remastered dataset, will be housed at SOPAC and copied to host countries.

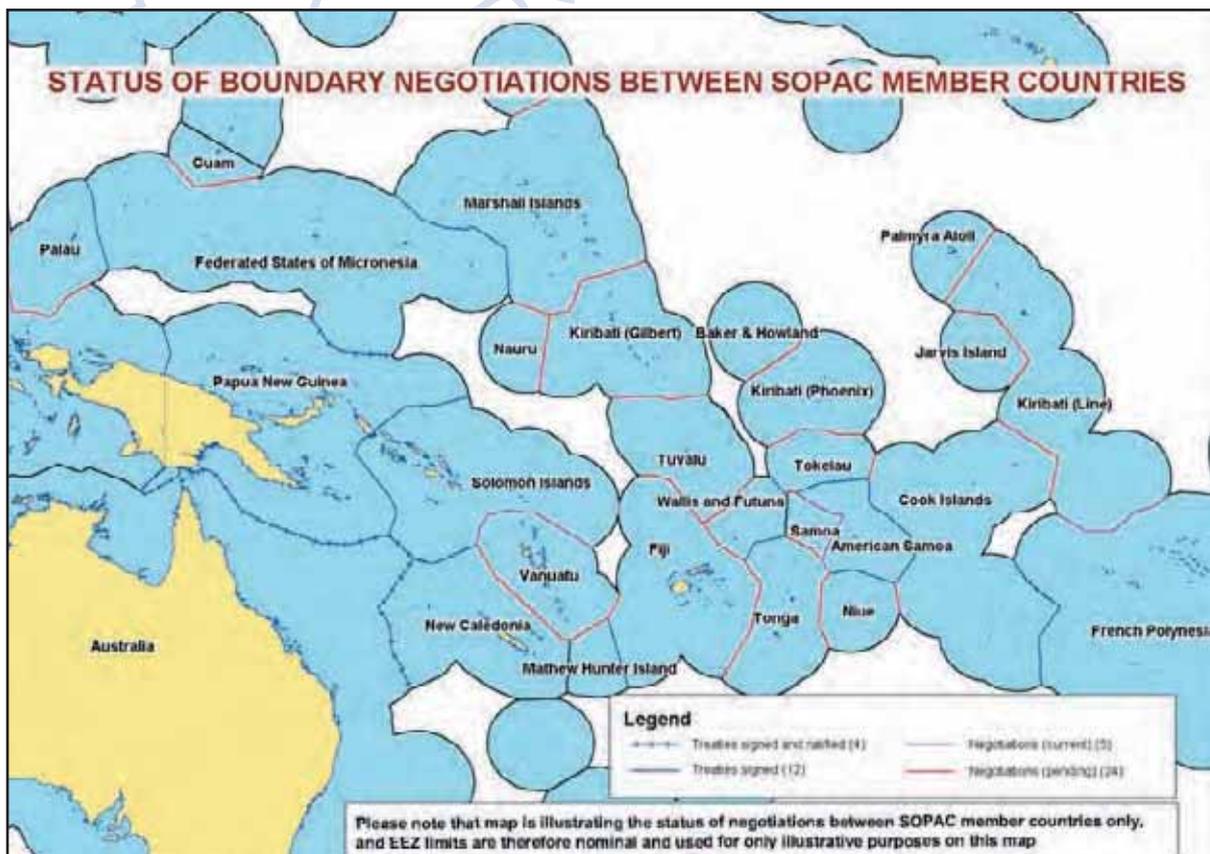
Current high oil prices have meant renewed recent interest in oil and gas exploration both regionally and globally with consequent increased demand for access to the SOPAC Petroleum Data Bank. As this trend is expected to continue, housing the databank at SOPAC, and managing requests for information, will have resource implications for the OIP.

OIP also holds access to a number of discrete databases and databanks including:

- PIRMBIS – Pacific Islands Regional Maritime Boundaries Information System.
- The Marine Scientific Research Database which includes about twenty years of marine mineral research, conducted under the auspices of the joint MMAJ-SOPAC programme.
- Data acquired under the EDF8/9 Project – Reducing Vulnerability of Pacific ACP States.
- Data acquired under programme activities in most SOPAC member countries, including holdings related to the Sea Level and Climate Monitoring Project (SPSLCMP).

Effective data management is essential to gain maximum benefits and provide member country access but requires strengthening of technical and human resources within OIP and the Secretariat.

2) Capacity Development — Capacity building is an imperative of SOPAC's work programmes and is enhancing skill sets and delivering opportunities for greater regional development. Important capacity building initiatives include formal courses in geoscience such as the Certificate in Earth Science and Marine Geology [CESMG]; regular guest lecture commitments



at USP (e.g. Coastal Vulnerability and Processes); participation in technical workshops and meetings; trainee attachments at the Secretariat for specific work programme activities such as university post-graduate, co-supervision; development of GIS, remote sensing interpretation and database development); and in-country activities such as the SPSLCMP-coordinated IPCC regional outreach programme.

A submission to the Commonwealth Secretariat seeking continued CFTC support for resources to enable the delivery of a new CESMG course cycle, prompted CFTC to suggest that serious consideration be given to move the CESMG to USP under its Islands and Oceans Faculty. In preliminary discussions between USP, ComSec and SOPAC, USP expressed a willingness to accept the move. However, details and funding requirements still remain unclear and further discussions are required.

Capacity building is essential to ensure sustainability of programme interventions. The lack of national technical capacity and capability is perhaps the single greatest challenge to countries striving to achieve sustainable development. If

SOPAC is to continue to provide relevant, quality results and ongoing support to member countries, targeted capacity development and skills transfer would be necessary through:

- professional attachments at the SOPAC Secretariat;
- on-the-job training on specific activities across the work programmes either at the Secretariat or in-country; and
- national, regional and sub-regional workshops.

Monitoring Physical and Chemical Change in Ecosystems

1) Sea-Level and Climate Monitoring – SPSLCMP Phase IV — The South Pacific Sea Level and Climate Monitoring Project (SPSLCMP) is part of an Australian initiative to support the long-term monitoring of sea-level variability and rise in the Pacific. After completing its 15th year at the end of 2005, the project now represents one of the longest efforts at monitoring regional climate and ocean data in the region and is a valuable and growing dataset.

“SOPAC can show us the way to go with strategic plans and is very good at applied work and at producing good data.” Scientific Technical Adviser, New Caledonia, Dr Yves Lafoy

SOPAC became engaged in the implementation of the third phase – SPSLCMP III. This involved providing assistance in carrying out CGPS and geodetic surveys and maintaining SEAFRAME sites in countries in conjunction with the National Tidal Facility (NTF) and Geoscience Australia. SOPAC will continue this engagement in Phase IV (2006-10), which is managed by the Bureau of Meteorology, Australia (BoMA). Given the age of existing equipment as well as the need to integrate some stations within the regional and Australian Tsunami Warning Network, it is likely that upgrades of existing stations will occur in the later stage of Phase IV. Additionally, Phase IV will increasingly concentrate on data products and information dissemination at all levels in country. A Regional Communications and Coordination Adviser is being recruited to SOPAC for this purpose.

Although support for these activities is ensured for the coming years, further consideration will need to be given to the role of SOPAC and members in this important initiative as the project evolves.

2) Bathymetric Mapping and Modelling Capabilities — SOPAC has a unique regional capacity with its single and multi-beam swath mapping and seismic systems. Potential areas of application include detailed mapping of harbours and nearshore shipping lanes, correction of hydrographic charts for maritime transport safety; seabed mapping and seismic surveys for identification of offshore aggregates and for continental shelf delimitation; mapping to support habitat characterisation for “ecosystem based” management (EBM); hydro-dynamic modelling of lagoons and nearshore for fisheries, aquaculture and marine protected areas; and identification of submarine geo-hazards and tsunami modelling.

The ability to provide products such as maps and models, which can be integrated with other ecosystem data and used by a range of users for planning and management purposes, has enormous value and potential. For example, many hydrographic charts for nearshore waters are inaccurate and pose a danger for shipping. SOPAC may potentially become a regional hydrographic centre for the updating of such charts.

In 2007, SOPAC will have an opportunity to showcase this work to the region and also an

international audience as SOPAC will partner with the Circum-Pacific Council for Energy and Mineral Resources, SPC and the Government of New Caledonia to host GeoHAB 2007 (May 2007). Held biennially, GeoHAB is a major international conference on marine habitat mapping. Under the EDF Programme, high-resolution bathymetric charts of key target locations in thirteen nations were reviewed and completed.

Much of this work, including technical staffing, is funded under the EU EDF 8/9 Reducing Vulnerability of Pacific ACP States Project, which will cease in 2007. This capacity will need to be retained in the programme if we are to continue to deliver these valuable services to the region.

3) Tsunami Monitoring and Early Warning Systems — There has been significant global activity on establishing and maintaining adequate tsunami monitoring and warning capabilities since the December 2004 tsunami in the Indian Ocean. Given the active plate margins, which several member states straddle, as demonstrated by recent quakes offshore of Tonga, Vanuatu and Fiji, the need for reliable monitoring systems to effectively monitor tsunami has long been recognised as essential for the Pacific region.

There are a number of regional and global statements and initiatives triggered by the Indian Ocean tsunami, the most regionally significant being that of Australia to establish/upgrade tsunami warning systems for the Pacific and Indian oceans. Australia will establish a physical network of monitoring gauges around the region over coming years. The establishment and maintenance of a monitoring network will likely to be linked to the existing SPSLCMP network.

The tsunami threat faced by PICs is a complex mix of tsunami from local, regional and distant sources whose effects are highly dependent on variations in seafloor shape between the source and the affected area. This makes design of an effective warning system problematic. Geoscience Australia, with AusAID funding, will work with SOPAC to undertake a comprehensive risk assessment for the region, including the development of tsunami risk assessment tools.

Response and warning mechanisms need to be developed in parallel to achieve a workable end-to-end warning and response system. This

“SOPAC is helping the Marshall Islands in many ways. They have assisted with our understanding of our environment and take leadership in ways forward as we progress with environmental and development issues. SOPAC has also done lots of work in capacity building training. Embassy of the Republic of Marshall Islands, Ambassador H.E. Mr Mack Kaminaga

activity will complement the proposed work of SOPAC's CRP and BoMA under the National Capacity Assessment: Tsunami and Multi-hazard Warnings Project.

4) Coastal Vulnerability Assessment & Monitoring — Shoreline processes, coastal vulnerability and especially the issue of erosion is of concern in many PICs, particularly the atolls. The coastal processes component under the EU-funded Reducing Vulnerability Project has produced analysis of historical shoreline position trends (dating back as far as 60 years) in Kiribati, Tuvalu and Solomon Islands; and has held information and capacity building workshops pertaining to this work in all three countries. Longer-term training attachments and postgraduate supervision in this sector has also been undertaken.

Increasingly, within the region shoreline erosion is locally equated with climate change stress and the coastal processes component has developed monitoring products to address the regional need for climate stress related monitoring of shoreline environments. Additional benefit of this work is the development of clear vulnerability assessments and the relationship between poor coastal zone practises and erosion. An additional related task area has been the assessment and development of monitoring systems in low-lying nations where salinity incursion in swamp taro cultivation pits is perceived as a problem.

5) Eutrophication — Eutrophication (nutrient enrichment through catchment development and change) is the major driver of change and environmental issue disturbance in nearshore marine environments and nitrogen is the major limiting nutrient in marine systems. The myriad of more recent catchment development

changes in regional and international nearshore settings, has resulted in human activities delivering approximately the same amount of nitrogen to nearshore marine systems as that delivered naturally through environmental cyclic processes. This effectively doubles the amount of nitrogen in coastal waters and since nitrogen is generally the limiting nutrient in marine systems, excess nitrogen causes ecological change on an unimaginable scale. Tropical coral reef systems are especially intolerant of sustained change in nutrient regimes and permanent damage from nutrient enrichment has occurred in many of the regions urban reef environments (e.g. Fiji's coral coast, Queensland's Great Barrier Reef's inner reef and Tarawa Atoll).

Addressing issues pertaining to the chemical components of the nearshore marine ecosystem is vital to maintaining our nearshore ecosystems in a viable, resilient and sustainable manner. There is a current lack of baseline information or monitoring of water quality change to track reef response. Given the vulnerability of fragile reef systems to nutrient enrichment and the importance of these systems to the viability of PIC communities and economics, monitoring and understanding chemical change in the marine environment is of critical importance.

At present SOPAC is not involved in any major chemical monitoring activities or analysis of coastal systems with respect to ecological maintenance. This is generally a core function of regional geoscience organisations, (e.g. Geoscience Australia, who lead in coastal biogeochemical cycling and monitoring, recognise that this is not simply a "biological" issue but a specialist discipline more closely related to Geoscience). The synergies with OIP's existing



Current meter deployment and flow measurement to calibrate hydrodynamic model, Fanga'uta Lagoon, Tonga.



Precision levelling monitoring survey in Betio, Kiribati as part of the South Pacific Sea Level & Climate Monitoring Project.

marine survey and hydrodynamic modelling work are obvious and currently no other Pacific regional organisation is taking the lead on this important issue.

Ocean Governance

1) PIROP-ISA Pacific Regional Ocean Policy and u want one dicFramework for Integrated Strategic Action (PIROP-ISA) — is a broad-scale regional integration and planning process that is a significant step towards developing regional approaches to ocean governance and resource management over the entire Pacific region. The process was guided by the Marine Sector Working Group of the Council of Regional Organisations of the Pacific (CROP). SOPAC is currently a co-chair of this group and hosted its latest meeting. Like all broad-scale integrative processes, it is difficult for any one organisation to maintain an overview of PIROP and its implementation so involvement of the MSWG remains critical to delivering outcomes that will make a sustainable difference.

The importance of PIROP is clear when discussed at the international level, particularly in the context

of United Nations consultations on Oceans and Law of the Sea. PIROP is invaluable as a unified regional approach to ocean management and governance. As individual CROP organisations have reached the limit of their abilities to drive this forward without detracting from existing work programmes, further progress is only likely if significant new resources are committed.

For the PIROP-ISA to progress, the region must devote specific resources and establish a Pacific Islands Regional Ocean Policy office, with at least one full-time staff member, in an existing regional organisation. The initial primary function of this office would be to assist the MSWG and other specialised agencies in working together to assist participating countries and territories in developing support for their own domestic ocean policies.

This would include developing proposals for the implementation of the PIROP-ISA to concentrate on harnessing resources to develop and implement national ocean policies; establishing channels of communication to assist both the CROP Marine Sector Working Group and national UN delegations involved in the informal Oceans working group.

“SOPAC is a tremendous help for us with technical assistance for maritime boundaries. They have also helped with coastal management and erosion. We are happy with SOPAC because whenever we have a request small or big, SOPAC responds and helps us find a way to help ourselves.” Embassy of the Federated States of Micronesia, Deputy Chief of Mission, Mr Gabriel Ayin

2) Maritime Boundary Delimitation and Extended Continental Shelf Claims

— The Pacific Islands Regional Maritime Information System (PIRMBIS) now contains the computed critical basepoints, and the extrapolated notional maritime boundaries for Tokelau, American Samoa, Fiji, Vanuatu, Marshall Islands, Federated States of Micronesia, Palau, Tuvalu, Kiribati, Cook Islands, Niue and Nauru. Existing treaties have also been incorporated into PIRMBIS.

SOPAC has also commissioned the services of the National Oceanographic Centre (NOC) in the UK to undertake desktop assessments for Palau, Federated States of Micronesia, Solomon Islands, Vanuatu, Kiribati and Tuvalu.

The role of SOPAC and the way forward will be clarified at the senior government level after desktop studies are completed. A high-level meeting with relevant countries will be held to discuss the findings, funding and SOPAC support for the submissions phase.

SOPAC is currently in discussions with Ireland and Norway for both legal (Ireland) and funding (Norway) support for the submission phase. Ireland recently brokered a joint Extended Shelf submission with France, Spain and Portugal, as the first joint submission to the Commission.

3) Resource Economics — OIP is currently embarking upon a series of economic analyses to improve the governance of ocean and island resources. Studies are intended to contribute to more strategic and community-focused use of resources by providing information to government and community stakeholders on the impact of using resources in different ways.

The economic analyses currently underway include cost-benefit analysis of interventions such as Maritime Boundary Delimitation, alternative options for aggregate extraction and economic valuations of resources and feasibility

assessments of activities such as the commercial Lagoon Aggregate Dredging Company in Kiribati. In addition, analysis is planned as part of the SOPAC-wide EDF Reducing Vulnerability Project.

Programme Resources — The availability of programme resources, both in terms of staffing and field equipment for the effective delivery of the programme's work plan remains a critical issue. To ensure delivery of an effective field programme, ongoing maintenance and upgrade of specialised field equipment is critical.

The existing GPS survey equipment is twelve years old and as maintenance is no longer offered by Trimble Geosystems, they will need to be replaced. With new technology emerging there are GPS units now capable of carrying out multi-purpose tasks such as geodetic and topographic surveys, facilitating digital terrain models, integration of RTK GPS surveys with other GPS surveys (Differential and Static) and ground-truthing of satellite imagery with better accuracy. These units will improve accuracy levels for the maritime boundaries project as well as other GIS applications across all SOPAC programmes.

Regarding personnel, the following areas are needing advisers and project officers to assist in programme delivery – coordination of marine scientific research (particularly in the development and maintenance of databases); and coastal processes and aggregates (currently funded under EDF 9). A geological technician is sought urgently to understudy the incumbent reaching retirement age.

Additional funding has secured the PI-GOOS position for an additional three years and through SPSLCMP to secure a senior adviser Climate Communications and to support the salaries of the Project Officer – Surveying and the Electronics Technician.

“Our association with SOPAC goes back 35 years. They are a very positive resource and have done a lot of work for us and have expanded from mineral resources monitoring and assessing to economic analysis. This has been very useful for us and now SOPAC is playing a huge role in assisting us with better management of our water supply. We have more community driven programs which SOPAC is responding to with their three programme areas. SOPAC is part of a whole community process of development and not just technical anymore.” Secretary, Cook Islands' Ministry of Works, Mr Atatoa Herman

Background

SOPAC, through the Community Lifelines Programme (CLP) is committed to working with officials, government and industry representatives to raise Pacific living standards by enhancing community access to sustainable energy, freshwater, IT and communications.

Summary of Key Activities

Resource Assessment, Development and Management

© In partnership with UNESCO and WMO and with NZAID funding, SOPAC organised the third and final course under the Hydrological Training Programme for hydrological technicians from the Pacific region. Four training workshops over three years assisted 39 technicians from 13 Pacific Island countries and one from the Maldives. The Programme was established as a precursor to the Pacific HYCOS Project to better enable hydrological technicians to support NHS directors in project implementation.

© As a pilot project on behalf of the United Nations University, SOPAC supported the development of a Post-Graduate Diploma in Integrated Water Resources Management (IWRM) offered by the University of the South Pacific (USP) in Distance and Flexible Mode. The course will run on a part-time basis for approximately eighteen months and be coordinated through the UN Water Virtual Learning Centre (WVLC), newly established at USP. Ten fully-funded scholarships or study positions are available for suitably-qualified post-graduate students from the 12 member countries of the USP region.

SOPAC is working closely with USP to facilitate the IWRM Course by providing case studies as part of the course material for the Pacific region.

© Two regional proposals were submitted to the EU-Water Facility 1st call for proposals on behalf of the Pacific ACP States. The Pacific Hydrology Cycle Observing System (HYCOS) Project will run over three years (2006-2009) and be implemented by SOPAC with in-country counterparts at the National Hydrological Services, in collaboration with WMO, UNESCO and the Fiji Meteorological Service.

Core activities include flood forecasting; water resources assessment in major rivers; water resources databases; drought forecasting; and groundwater and water quality monitoring and assessment.

A second project to support the development of national IWRM and Water Use Efficiency plans through the establishment of a regional IWRM Resource Centre and support of in-country national consultations was unsuccessful in the 1st Call. However, it was considered suitable for funding and subsequently added to the Water Facility's reserve list. The proposal has been resubmitted for the 2nd Call, with results expected in December 2006.

"SOPAC is helping Niue in a lot of areas and I hope this continues, especially with water and energy. SOPAC assistance is improving the lives of people in Niue. They are helping with assessment and policy. SOPAC has come a long way (in 35 years), expanding, more responsibilities in the region and this is a good thing. We are sharing experiences throughout the region, and SOPAC is creating opportunities for this. We have similar but different problems." Mr Deve C.K. Talagi, Director of Works, Niue Public Works Department



Capturing ground control points.



Patrick Amini and Moefaau Titimaea at the 4th World Water Forum, Mexico.

© SOPAC, WHO and IAS/USP secured funding from NZAID for 2006-2009. Funding will support a Regional Water Quality Monitoring Programme aimed at creating a sustainable national capacity for maintaining safe quality drinking water, surface, ground and coastal waters. The Programme will be piloted in five countries and a selection process is now being finalised.

© SOPAC supported UNESCO's Pacific Hydrology for the Environment, Life and Policy (HELP) Symposium which focused on devising ways HELP can contribute to strengthening catchment area management practices. Pacific participants developed a draft framework for action, "HELP in the context of the Pacific Regional Action Plan on Sustainable Water Management".

The Symposium also examined ways in which Pacific Island agencies and communities can better manage land usage and reduce impact on river and coastal areas. This is the basis of Integrated Catchment Management and a focus of the UNESCO HELP Programme along with a demonstration of the HELP Basin Project. SOPAC provided technical and financial support to build the capacity of Pacific Island countries in the management of freshwater resources.

The Pacific Hydrology for the Environment, Life and Policy (HELP) Symposium (7-11 November 2005) marked the first formal HELP event to take place in the Pacific region. The Symposium was jointly hosted by the New Zealand crown research institute Landcare Research and the UNESCO Apia Office.

Outcomes of the Symposium were featured at the 13th Southeast Asia and the Pacific IHP Regional Steering Committee meeting in Bali, Indonesia, 21-25 November 2005. Also

featured were other activities undertaken in the context of UNESCO-IHP in the Pacific through the Pacific Partnership Initiative on Sustainable Water Management.

© The World Summit on Sustainable Development (WSSD) in Johannesburg in 2002 called for all countries to produce integrated water resources management (IWRM) and water efficiency plans by 2005. An update on progress of IWRM implementation was sought by the Global Water Partnership (GWP) and based on questionnaire responses, a summary report was presented at the 4th World Water Forum.

The Japan Water Forum (JWF) approached SOPAC to assist in drafting and finalising the Pacific sub-regional part of the Regional Position Paper for Asia and the Pacific. This was presented at the 4th World Water Forum, 16-22 March 2006 in Mexico.

© In response to a request by regional diplomatic missions at CSD12, the Global Environmental Facility (GEF), through UNDP, signed a PDF-A agreement with SOPAC in November 2004 to develop an innovative programme on Sustainable Integrated Water Resources Management (IWRM) in Pacific Island Countries (PICs). Based on the endorsement of 10 PICs, the GEF approved entry into the GEF pipeline of this proposal and approved the request for financial resources to further develop the project and the PDF-B phase in the coming two years. The full-sized project is to be implemented by UNDP and UNEP and executed by SOPAC through the Pacific Partnership in the period 2007-2012. The project will support PICs in the implementation of the Pacific Regional Action Plan on Sustainable Water Management that aims to improve the assessment and monitoring of water resources; reduce water pollution;

Biofuels in the Pacific: Colonial Heritage Saves the Future?

The steadily increasing world market price for fossil fuels has aroused significant interest in the development of local sources of energy in the Pacific Islands. Key experiences in Vanuatu, Samoa, Papua New Guinea, Solomon Islands and Fiji indicate that there is a special case for the economic viability of biofuel in the Pacific.

Over the last 20 years, the price of coconut oil on the world market has consistently decreased, and after a period of relatively low diesel prices. The last five years have seen diesel prices progressively increase. Only recently, imported diesel in the Pacific has become more expensive than the net value of exported coconut oil, suddenly making coconut oil a serious commodity option for internal use as biofuel.

At the global level, ambitious targets set by countries to achieve a significant reduction in fossil fuel usage has caused an increase in world market prices for vegetable oil and sugar, as well as a tempering effect on crude oil prices. At the same time, environmental concerns that are driving the biofuel industry in the European Union are causing environmental problems through wide-scale deforestation for palm plantations in Malaysia and Indonesia.

In the Pacific, the call for the use of locally produced biofuels has been based mainly on the desire to reduce dependence on imported fossil fuels. However, research conducted by the Pacific Islands Applied Geoscience Commission (SOPAC) about the impact of biofuel on government finances, found that as coconut oil and sugar are important export products, using them to replace imports will also cause a decrease in total export revenue. In addition, if duties and excises are waived so as to promote the use of biofuel, the total impact on Government finances might be negative.

In Fiji, the relatively small size of the sugar industry makes it difficult for Fiji to be competitive with ethanol on the world market. However, the cost levels appear to be close to serving Fiji's domestic market with a petrol substitute. The World Bank will investigate this further in 2007 in partnership with the Fiji Sugar Corporation. Although costs to produce biodiesel based on coconut oil are still quite high, another cheaper option is the use of waste vegetable oil as raw material, which can make it competitive with regular diesel.

In other Pacific countries, Tobolar Copra Mill in the Marshall Islands is retailing a 50/50 filtered coconut oil and diesel blend below the price of regular diesel. Recently, a SOPAC inspection

into a local car run for three years on various coconut oil blends, found no long-term engine deterioration and one can now even smell coconut fumes along the main road in Majuro.

In Vanuatu, there are two retailers refining coconut oil to either a mix with 20 per cent kerosene or with 50 per cent diesel. Despite the reduced prices supported by government, the uptake is still limited, but nonetheless growing. In September, a similar blend was launched by Solomon Tropical Products in Honiara at the 2006 National Trade Show after testing their product in local vehicles.

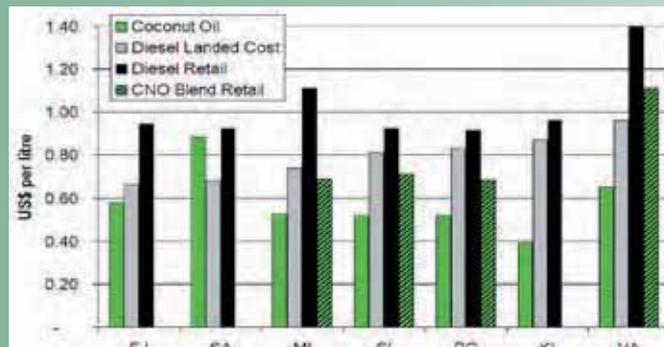
In Samoa, SOPAC has assisted with the use of coconut oil as a fuel in power generation, with EPC, the power utility in Samoa. In Vanuatu, the power utility UNELCO embarked on 'industrialising' the production of fuel-grade coconut oil and are using it in their generators in a blend of 10 per cent that is supporting the local industry and decreasing emissions.

In PNG, many local suppliers of fuel have started to blend filtered coconut oil with diesel, including Unitech in Lae, who have been successfully trialing biofuel blends in engines as part of their mechanical engineering research. Another supplier, PNG SD, is using mining proceeds to attempt to make power generation in remote communities commercially viable.

Many technical options exist to utilise biofuel. The big question however, is where we will get the raw materials to produce biofuels. At the global level, International Energy Agency scenarios suggest that biofuel can only contribute to about 20 per cent of transport fuel consumption in 2030 due to problems with arable land availability and food market competition; however, in the Pacific, assuming significant government support for major replanting and industry restructuring, SOPAC estimates that the current regional potential in 2010 for biofuel (ethanol and biodiesel), is about 30 per cent of all transport fuels.

As there is no country in the world that has a biofuel industry without the backing of government policies and incentives, there is a very important role for national legislators in the region to ensure the adoption of standards and provide tangible support.

The Pacific biofuel advantage is in no small part due to our natural resources. Our colonial heritage of dedicated coconut tree plantations gives us the edge to make biofuel a real economic and environmental alternative. Although we will not be able to replace all fossil fuels in the near future, biofuels provide part of the solution and should therefore be pursued vigorously by governments in partnership with the private sector. Biofuels will then decrease our dependence on fossil fuels and build greater confidence in our own Pacific assets.



Selected regional prices, sorted by landed cost of diesel, of a) coconut oil net revenue, b) landed cost of diesel (excluding taxes), c) diesel retail prices and d) retail prices for filtered coconut oil blends with diesel as of August 2006. SA, FJ, KI have no biofuel retail.

improve access to technologies; strengthen institutional agreements; and leverage additional financial resources to support IWRM.

- © As crude oil prices increased over the past 12 months, regional biofuel energy options have become increasingly important. As a consequence, there has been an increase in interest in evaluating the viability of alternative fuel options, especially locally-produced biofuels. SOPAC has continued to monitor progress and distribute research findings and relevant international development information.

Many Pacific countries are developing remote island capabilities to produce fuel with varying degrees of success. SOPAC continues to provide important technical support for many of these pilot projects.

- A feasibility study for the Samoan Electric Power Corporation (EPC) on the viability of using coconut oil on the island of Savai'i.
- A national biofuels workshop in Tarawa in April 2006 with all major stakeholders, which delivered a strategic action plan that called for an expansion of trials by the Kiribati copra milling company using a blend of filtered coconut oil with diesel.
- An evaluation of the SPC-installed biofuel projects on Taveuni and Vanua Balavu in Fiji.

- © UNDP requested SOPAC assistance with further investigation into the applicability and technical feasibility of copra oil as a fuel for power generation and transportation within the Pacific. Similar requests were received from Vanuatu, Fiji and the Marshall Islands.

- © The Fiji Resilience Building Project (Preparatory Assistance Project Proposal – Development of a National Biofuels Programme to Prevent Significant Loss of Rural Employment in Fiji) funded through the UN GEF PDF-A, has assisted the Government of Fiji in defining, formulating and finalising a comprehensive strategy. The strategy aims to evaluate the feasibility of a national biofuels programme to transform the sugar cane for sugar industry into a renewable energy industry; helping to reduce dependence on petroleum imports; provide employment; and protect freshwater and other environmental resources. The PDF-B application under the GEF was not accepted by UNDP as there are no operational programmes allocated for the increase of biofuels.

However, UNDP did provide the Fiji Government an additional US\$50,000 for initial in-country activities to promote the establishment of a biofuel industry. SOPAC continues to assist with the implementation of the Fiji biofuels initiative.



Workers of the Kiribati Copra Mill unloading copra for coconut oil production.

© The PDF-A phase of the project for the Promotion of Environmentally Sustainable Transportation in the Pacific Islands (PESTRAN) was successfully completed after national consultation workshops and the compilation of country reports highlighted

constraints and emerging energy challenges in the land transport sector in participating countries – Fiji, Samoa and Vanuatu. A Medium Size Project (MSP) brief has been developed for submission to GEF-4. With the newly-introduced Resource Allocation Framework



Fiji Electricity Authority (FEA) 10-MW wind farm at Sigatoka, Fiji.

Space technology helping local communities

The annual regional Geographic Information Systems/Remote Sensing (GIS&RS) Conference aims to provide international technology experts, local government and private sector officials with an opportunity to find technology solutions to problems such as water shortages, coastal erosion, natural disasters and environmental degradation.

Since the first GIS&RS Conference in 1999, the event has supported RS technology that provides companies, and governments with detailed satellite images of land and sea areas to help better manage resources such as coastlines and forests. It also involves GIS digital maps, easily updated electronically, that can assist governments more effectively supply services such as water, telecommunications and electricity.

The conference enables participants to upgrade their skills and refine methods to suit local needs which include the identification of potential flood zones, understanding cyclone behaviour, forest maps to better protect forests and shallow water bathymetry (water depth) to assess potential for fishing and dredging.

Participants are also introduced to the different software available, some of which may be free and open and greatly benefit small regional organisations that are normally set back by the lack of finances to start up their GIS setups.

SOPAC remote sensing expert Wolf Forstreuter said the important thing about satellite technology is that it provides clear and unambiguous imagery data that can help people more effectively plan before starting a project in cities, coastal towns, settlements and villages.

“Using this technology means that everyone is now seeing the same thing and speaks the same language, which avoids misunderstandings and misinterpretation of data material. Visualisation is also critical to better planning and can be used in a range of areas including the tackling of coastal erosion, deforestation, improved farming and more efficient electricity consumption,” Mr Forstreuter said.

SOPAC is providing countries in the Pacific with high-resolution national satellite images, which are being used extensively by governments and local companies. This support is part of the joint EU/SOPAC Project: Reducing Vulnerabilities in Pacific ACP States.



Details on pan-sharpened QuickBird images (60 cm spatial resolution). The image above was recorded from Lae through the SOPAC-EU Project. Not only details of the ship crane during the unloading process are visible, but also the lines with which the vessel is fixed on the wharf.

(RAF) of GEF-4, new endorsement letters have been requested from the participating country GEF focal points. The endorsement will also provide direction as to the future of the project either at sub-regional or national level. The project is expected to commence in 2007.

- © The 20-kW demonstration wind turbine installed within the Fiji Department of Mineral Resources compound adjacent to the SOPAC Secretariat in Nabua, as part of the Wind Energy Education Programme, continues to be monitored by SOPAC. As originally agreed, ownership of the turbine had been transferred to the University of the South Pacific (USP). A regional workshop on wind energy was held in November 2005 marking the completion of project activities. It called for greater sharing of information on resource assessment results and continued capacity building in the Pacific wind energy sector. SOPAC and USP are continuing discussions with the Danish Government for the continuation of wind energy support.
- © In partnership with UNDP, and with funding from PIEPSAP and NZAID, SOPAC has acquired four wind monitoring towers, anemometers and data logger equipment. Two monitoring stations will be erected on Upolu (Samoa), one on Rarotonga (Cook Islands) and one in Funafuti (Tuvalu). The wind monitoring installations will be commissioned in the second half of 2006, for a minimum of two years. These will provide important data to assess potential wind energy resources.
- © In Mangaia (Cook Islands), two 20-kW Vergnet wind turbines were installed in 2004 as part of SPC's PREFACE Project. SOPAC has since assisted the Cook Islands' Government with identifying why anticipated diesel savings did not occur. This has resulted in the development of a funding proposal for a system upgrade and submission to the original project donors, Australia and France.
- © Encouraging results were obtained through data from initial wave energy monitoring, including site-specific data in Fiji and the Cook Islands. Recent progress includes information sharing with Société de Recherche du Pacifique (SRP) in New Caledonia towards building a demonstration plant. Further development of regional wave energy resources will be dependent on the availability of commercially-proven technology.



Mr Rupeni Mario presents at the Renewable Energy for Poverty Reduction (REP-PoR) consultation meeting in Suva, 2006.

- © Other activities in 2006 to support regional experience and information sharing included:
 - Coordination of the regional workshop in November 2005 for the joint presentation to PICs of the Renewable Energy Project for Poverty Reduction (REP-PoR) and the Pacific Renewable Energy Training Initiative (PRETI) projects.
 - Convening of a sub-regional workshop on solar PV in Tonga, May 2006, as part of the SURE Project.
 - Promoted ICT applications using GIS and Remote Sensing tools through publications, like the regional GIS and Remote Sensing Newsletter; via the online discussion list GIS-PacNet; and the important regional GIS&RS User's Conference in Fiji.
 - GIS/RS training activities were conducted in Papua New Guinea, Fiji (3), Kiribati, Tuvalu (2) and Palau as part of SOPAC/EU Project activities. Training courses supported the establishment of new GIS&RS units and the enhancement of existing ones. Although hardware and software are affordable, the transfer of know-how continues to present a major challenge.

Asset Management

- © SOPAC and the Pacific Water Association (PWA) secured funding from NZAID for the Pacific Water Demand Management Programme. This was developed in response to actions identified under Theme IV



Technicians attending the Pacific Hydrological Training Programme carrying out field survey on Moturiki, Fiji.

(Technology) in the Pacific Regional Action Plan on Sustainable Water Management and aims to improve capacity for water demand management in urban water utilities. The programme is designed to work through local team leaders within each participating utility. Funding will be used to purchase both “hardware” such as water meters, leak detection equipment or bulk water-saving devices for incentive or rebate schemes, as well as “software” that includes training, community education materials and technical expertise.

the Pacific by increasing access to accurate climate information. The level of success of the ICU in achieving objectives has recently been assessed through a survey questionnaire and results were presented at the 11th Meeting of Regional Meteorological Services Directors in July, in Noumea. The ICU was endorsed by NMS Directors and climate research institutions who acknowledged it as a valuable tool contributing to meeting regional climate forecasting information needs. A joint proposal will be submitted to NZAID for a three-year continuation of the programme.

- © A training course for wastewater management was jointly developed by UNEP’s Global Programme for Action for the Protection of the Marine Environment from Land-based Sources of Pollution (GPA/UNEP) with the UNESCO-IHE Institute for Water Education. The course addressed one of the guiding principles of the Pacific Wastewater Policy and Framework for Action and was implemented in the Pacific region in 2005-2006 by a SOPAC partnership with USP-IAS, IOI, SPREP, UNESCO-IHE, GPA/UNEP and UN/DOALOS. A training needs assessment for the Pacific region was conducted and three sub-regional wastewater courses were organised in Fiji, Guam and Papua New Guinea.
- © SOPAC implemented the Pacific Island Climate Update (ICU) in partnership with SPREP and NIWA and supported by NZAID. The Update aims to enhance planning processes in climate-sensitive sectors in
- © SOPAC, supported by UNESCO, provided assistance in water resources monitoring on Aitutaki in partnership with the Department of Water Works in Rarotonga. Equipment was purchased and a programme mapped out with the Aitutaki water supply manager to continue collection, analysis and interpretation of groundwater monitoring data to help officials make informed community-focused decisions for the management of local water resources.
- © The Pacific Resource Centre on Water and Climate was established at SOPAC and funded by the ADB. The Centre aims to improve water resource management to cope with increasing variability of the world’s climate, by providing policymakers and water resource managers with access to important information generated by climatologists and meteorologists. The Centre established a Pacific Water and Climate Focal Group to promote implementation of the Pacific Hydrological Cycle Observing System



Mr Jan Cloin promotes the use of locally-produced biofuels such as coconut oil during the Solomon Islands Trade and Culture Show in Honiara.

(HYCOS) Project and disseminate relevant information on water and climate. Information access is essential to enabling officials to make decisions to better protect communities vulnerable to climate change.

- © SOPAC is working with SPREP and NIWA as part of a joint initiative funded by the New Zealand Ministry of Environment, to rescue, preserve and digitise historic observations from Small Island Developing States. The “Historical Climate Data in Pacific Island Countries” programme is scheduled for three years, based on funding availability.
- © As a fundamental component of the SOPAC/EU project, the deployment of the Geospatial Content Management Server (GeoCMS) and its map servers continued with the installation of the Nauru GeoCMS. This system was also used as the Government website for e-government applications. The map server was implemented with the help of UNESCO in securing resources for a government IT department.

Vanuatu has had its GeoCMS re-implemented with the acquisition of a direct Internet link and the re-structuring of internet links within the Ministry of Lands. A wide-area network was set up between the various departments in town. GeoCMS hardware was delivered to Solomon Islands and installation and training

was implemented. Final assessment of viable sites to host GeoCMS was completed in 2003 and work started at SOPAC and in Tonga and Fiji on GeoCMS content. Niue, Cook Islands and the Federated States of Micronesia are currently being reviewed and assessed for installations.

- © Technical assistance was provided to PICs and Fiji-based missions with ICT-related issues (ISP strengthening; LAN/WAN deployment; equipment selection, and deployment). Also provided was technical assistance and support to utilities in GIS and Remote Sensing, including the provision of information and the procurement of data and satellite imagery. SOPAC acquired high-resolution satellite imagery for the following countries: Kiribati, Papua New Guinea, Cook Islands, Tuvalu, Fiji, and Marshall Islands.
- © SOPAC continued to gather detailed baseline ICT information to assess the status of ICT development in member states. SOPAC has conducted ICT assessments for Niue and Cook Islands with Palau and Nauru scheduled for later in the year. Technical support was also provided to Tuvalu in the design and implementation of the Government wide-area network (GovNET) to deliver fast, reliable and secure fibre-based network linking ministries and departments.

“Our MapServer training workshops encourage participants to contribute data to the MapServer, as a central information centre for use by stakeholders and members of the public, including school students doing projects, who would not otherwise have access to these maps.” SOPAC Adviser Litea Buikoto

- © The application of GIS and Remote Sensing as a tool for asset management within the Tuvalu Power Utility has generated the development of a tailored GIS system that could be replicated in other utilities within the region. This support also linked the Ocean and Islands Programme's coastal change work and flood history work conducted by the Community Risk Programme.
- © SOPAC has established an extensive Pacific-wide network of contacts and a wealth of local knowledge as a result of years of sustained involvement in ICT. SOPAC expertise includes cross-sectoral applications of ICT in networking; Internet provision support; policy development; databases; Geographic Information Systems and Remote Sensing (GIS/RS); capacity building; and Free and Open Source Software.
- © Demand Side Management (DSM) activities continued with FEA and EPC with FEA completing the implementation of a pilot DSM project which included the establishment of a DSM revolving fund. A regional DSM workshop for power utility engineers was convened in August 2006, in conjunction with the 15th PPA Annual Conference and the 3rd Engineers' Workshop. The Workshop contributed to further promotion of DSM in the region. A DSM Best Practice Guidebook on CD-ROM, including international case studies relevant to the region was produced during the workshop. Copies are available from the SOPAC Community Lifelines Programme.

Partnerships protecting the Pacific's lifblood

As people in the Pacific prepare themselves for another cyclone season, tsunami expert Noud Leenders from SOPAC, told Fiji Gold FM listeners that they needed to be prepared with an emergency kit that includes drinking water.

Countries in the Pacific are extremely vulnerable to natural disasters, which can devastate lives and homes and cripple already fragile essential services, especially water supplies.

Access to safe drinking water is critical to saving and enhancing lives in a region that has more than 37 and a half million kilometres of ocean and resources that need to be used and managed in a sustainable manner.

Although there are many cultural and geographical differences in the Pacific, there are also significant shared challenges, including isolation and scarce resources, that make working in partnership and sharing experiences, especially about water management, critical to improving the lives of people in the region.

"Water is the lifblood of the Pacific and although thousands of Pacific Islanders are surrounded by water, which laps on the doorsteps of many atoll homes, it is the groundwater resources that are a matter of life or death," SOPAC water specialist Davendra Nath said.

SOPAC is working in partnership with the World Health Organisation (WHO) and AusAID, to improve the health of people in the Pacific by strengthening their national capacity to maintain safe water supply systems.

An AusAID contribution of \$500,000 over two years to fund the Pacific Water Safety Plan Programme, is enabling SOPAC water experts and WHO health specialists to work closely with local communities and officials to develop Water Safety Plans (WSP) that protect their most important asset – water.

"Many atoll countries have extremely vulnerable groundwater reserves which are increasingly threatened by growing demands from population increase, urbanisation and tourism.

The threat of natural disasters such as cyclones, drought and tsunami make people even more vulnerable as their sanitation and water supplies are often already inadequate," WHO Environmental Engineer Steven Iddings said.

The WSP is an improved risk assessment and management tool designed to ensure the delivery of safe drinking water. The programme aims to minimise contamination of water sources, prevent or remove contamination during treatment and prevent contamination during storage and distribution. The initiative is also part of an important response to the regionally-endorsed Water Quality and Health Framework for Action and the UN's 2005-2015 International 'Water for Life' Decade.

Pilot programmes to establish WSPs commenced in mid 2005 in four countries (Vanuatu, Tonga, Cook Islands and Palau), chosen specifically as they reflect the differing environmental and governance systems in the Pacific and will enable lessons learned and materials developed to be replicated in other Pacific countries with similar geographical and technical systems.

In-country planning workshops have enabled key stakeholders to interact, often for the first time, including officials from health and environment ministries, private sector water suppliers and NGOs. Workshops have also raised the profile of water issues and are helping urban authorities improve delivery systems and empowering rural communities.

"We hope the WSP approach not only benefits people in urban areas, but also those in rural communities as people develop more control and understanding of their own water system and the importance of safe drinking water. Learning how to better protect wells from pollution and managing rainwater tanks will help ensure water supply is more consistent, accessible and safe," Mr Iddings said.

Partnerships are critical to the success of these water safety plans. At the strategic level, SOPAC is partnering with the global health expert, WHO. At the regional level, countries share experiences and materials. At the national level, government officials, the private sector and NGOs share responsibility for water delivery and at the local level, communities work together to better protect men, women and children from the threat of contaminated and unreliable water supplies.

Governance and Advocacy

- © The Japan Water Forum supported Pacific efforts to draft and finalise the Oceania sub-regional part of a Regional Position Paper for Asia and the Pacific that was presented at the 4th World Water Forum. One of the main outcomes of included the creation of the “Asia-Pacific Water Forum” (APWF). The Forum will provide an important new platform to gain political support for water management in the Asia-Pacific region with SOPAC to be the primary Oceania focal point.
- © Policy work under the EU-funded Programme for Water Governance has been undertaken in Fiji, Solomon Islands and Kiribati. In Fiji, the National Water Committee developed a draft National Water Policy which was approved by Cabinet for consultation before final approval in 2006. A scoping visit was organised for representatives from Solomon Island’s water sector to Apia, on invitation from Samoa’s Minister for Natural Resources, Environment and Meteorology to allow Solomon Island water stakeholders to engage with, and learn from water sector reform in Samoa. In Kiribati, the Programme for Water Governance saw implementation of actions identified in the National Water Sector Road Map.
- © The Coordination Unit of the Pacific Partnership Initiative on Sustainable Water Management received support from ADB to produce quarterly newsletters and develop a partnership website. A Water Action Matrix Database to monitor implementation of the Pacific Regional Action Plan on Sustainable Water Management by all partner organisations was established as a core function of the Unit.
- © SOPAC and Live and Learn Environmental Education (LLEE) organised the 2006 Pacific World Water Day campaign on “Water & Culture” under the overarching motto “Plan for Water, Plan for Life, and Water for Life”. Awareness materials comprising posters, photo packs, stickers and water and culture bags were produced and distributed throughout the Pacific region. Special events were organised in Apia and Suva to mark World Water Day.
- © SOPAC contributed to the reformulation of the Framework on Climate Change and upgraded the Climate Change Matrix of activities into a user-friendly database.
- © Technical assistance was provided to PICs through the Pacific Islands Energy Policy and Strategic Action Planning (PIEPSAP) Project with the development of national energy policies, including the review of national regulations and legislation, where requested. During the period the PIEPSAP Project also published its first Annual Report.

World Water Day

SOPAC WASH Officer Kamal Khatri said the Pacific World Water Day campaigns aim to highlight challenges facing countries in the region as global water use increases at more than twice the rate of population growth and more people than ever before are suffering due to water scarcity.

“Although countries in the Pacific have different lifestyles and diverse cultures, many people in the region share the daily challenge of securing an adequate supply of clean, safe freshwater. The theme challenges us to look at our current water resources in the Pacific in terms of usage, access, supply, demand, quality and responsibility of managing water resources.

“We encourage everyone, including housewives, school children, factory workers, business people and government

workers to think more about how they use water and the need to save water for future generations,” Mr Khatri said.

World Water Day emerged from the United Nations Conference on Environment and Development (UNCED) in 1992 and the importance of water continues to be recognised, with the UN General Assembly proclaiming the years 2005 to 2015 as the **International Water for Life Decade**.

“Celebrating World Water Day is an important activity to help increase community awareness of national and global water and sanitation issues. If the region is to achieve the water and sanitation Millennium Development Goal of halving by 2015 the number of people without access to safe drinking water and adequate sanitation, we must increase local action in conserving water,” Mr Khatri said.

“Map access is vital to building stronger communities as government officials can use maps in key development areas that include better town planning and the enhanced provision of essential services such as water and electricity.” SOPAC ICT Specialist Franck Martin.



Regional Strategic Planning and Awareness Raising Workshop — Pacific Energy and Gender Network (PEG), Nadi, Fiji.

of possible DSM activities in four utilities was prepared (American Samoa, Fiji, Samoa and Tuvalu). Implementation of demonstration projects has only been successfully completed with the Fiji Electricity Authority. Lessons learnt and implementation constraints have been attributed to many factors, including limited human resource capacity in the utilities and access to energy efficiency equipment/appliances.

Issues and Opportunities

1) Global and regional drivers — Globally, the Commission on Sustainable Development (CSD) process has provided significant opportunities for engagement with the international community on energy and related issues. The thematic focus for CSD14 & 15 is “Energy for Sustainable Development, Industrial Development, Air pollution/Atmosphere and Climate Change”. An issues paper was prepared through the CROP-EWG for the CSD Secretariat together with a detailed briefing paper for PIC NY Missions.

Although the Pacific Plan adequately addresses the ICT and energy sectors (Section IV) under regional priorities for immediate implementation, it fails to accord water and sanitation equal importance. As the Pacific Plan is a “living document”, SOPAC should also work to ensure water and sanitation receive recognition as important regional priorities critical to sustainable development.

2) Opportunities in Water & Sanitation — The past three years have seen unprecedented growth for regional water sector support. This has been guided largely by a number of strategic documents developed in conjunction with SOPAC over a number of years through a broad series of coordinated and comprehensive consultations.

These include:

- The Pacific Wastewater Policy and associated Pacific Wastewater Framework for Action (2001);
- The Pacific Regional Action Plan on Sustainable Water Management (RAP) completed in 2002; and
- The Drinking Water Quality and Health Framework for Action developed in 2005 to complement the Pacific RAP.

Key documents, along with the Pacific Partnership on Sustainable Water Management, has enabled a more coordinated and strategic approach to water sector activities. This coordinated approach has already proved successful in implementing projects or providing technical assistance to PICs. The SOPAC Secretariat is the Coordination Unit for the Pacific Partnership on Sustainable Water Management.

3) Pacific Energy Partnership Initiative — The Pacific Islands Energy Policy and Strategic Action Planning (PIEPSAP) Project was developed through the Energy Type II Partnership Initiative, “Pacific Islands Energy for Sustainable Development (PIESD)” in cooperation with the “European Union Energy Initiative (EUEI)”.

“Although many countries in the Pacific have unique cultural, language and political structures, many share similar economic and resource challenges, including energy needs and restrictions. “We need real answers to Pacific energy security problems, so working together to share information is absolutely critical for Pacific Island countries. Coming together at a senior official and ministerial level will provide an invaluable opportunity to forge smart energy solutions. “Reducing poverty, improving health and education services, and providing a stable energy supply for Pacific communities will support sustainable development, which is intrinsically linked to energy issues.”

SOPAC Director, Cristelle Pratt

PIEPSAP is a three-year project with a US\$1.8m budget and a staff of three. The Project has made a significant contribution to PICs in helping them develop energy policies and strategic action plans along with supporting other energy sector initiatives such as wind energy resource assessment, biofuel and energy and gender. A second phase of the project to contribute towards ensuring sustainability of current activities as well as providing opportunities to develop new initiatives needs to be considered. A mid-term review of the PIEPSAP Project was scheduled for 28 August 2006 to help determine the future of the Project.

4) Regional Biofuel Activities — The Secretariat contributed to activities associated with the UNDP – Fiji Resilience Building Project, and noted similar requests for assistance from other Pacific island countries. This was seen as a priority for the immediate future.

The feasibility study carried out in 2005 on the use of coconut oil in power generation by EPC Samoa resulted in a request by UNDP-Samoa and EPC for the SOPAC-led CocoGen Team to continue the work on an investment proposal for a coconut fuel production facility. The facility would be a part of the proposed new power generation plant in the island of Savai'i.

In partnership with the University of the South Pacific, the PIEPSAP Project has funded a MSc student research project on the most appropriate production of biodiesel. Results are expected to be available by the end of 2006.

5) Regional Energy (Officials) Meeting and Energy Ministers' Meeting — Convening a Regional Energy Officials' Meeting and an Energy Ministers' Meeting in advance of CSD15 in 2007, to help the region develop a strategic position was considered imperative. With the outlook of future fuel prices looking grim, and the very real and significant pressures on Pacific island economies of the price hikes of the past couple of years, the convening of a Regional Energy Officials' and Regional Energy Ministers' meetings should consolidate a Pacific position, and mobilise resources needed to ensure a sustainable and secure energy future for Pacific communities.

6) Digital Strategy, Wellington Declaration and Pacific Internet Resource Centre — Since the adoption of the Wellington Declaration by ICT Ministers in March, the first-year ICT development focus was on assessment of country readiness; development of policy; and establishment of web presence and e-mail capacity for government ministries and departments.

Over the past few years, CROP agencies have been working with a variety of web technologies and are implementing various aspects of e-government within the region. These experienced agencies are now considering an approach to help certain member countries achieve 'Wellington Declaration' goals with respect to the Digital Strategy.

The Forum Secretariat is looking at establishing a Pacific Internet Resource Centre (PIRC), involving various stakeholders, who would contribute to



Women in Technology Workshop during PACINET 2006.

"SOPAC has done some very useful work in the region. They ensure tangible outcomes that provide incremental improvements to the lifestyles of communities in the Pacific." PNG High Commissioner, H.E. Mr Peter Eafeare

advising CROP and countries on appropriate policies and activities and further development of ICT in the Pacific Islands. Currently, ICT is tackled by either industry via PITA or users via PICISOC. Governments do not yet have a utility to advise them independently. The role of the PIRC could fill this void.

Through long-standing promotion of ICT and Internet in the region, SOPAC has an important role to play in the PIRC and should be actively involved in the creation and possibly the running of the Centre for the benefit of Pacific Island countries.

Programme Resources

The following areas are considered critical to CLP service delivery:

- © Provision of adequate staff resources, particularly in the area of ICT outreach, GIS and Remote Sensing. Current ICT outreach activities, though limited in nature are generating significant interest, as is the installation of, and training in, the use of map servers within ACP member States under the Reducing Vulnerabilities of Pacific ACP States Project funded under EDF 8/9. The full potential of the use of Geo-CMS, GIS and its demonstrated use by utilities for asset management, mapping temporal change and information management are only just beginning to be realised. This raises the issue of the sustainability of interventions beyond current project timeframes.
- © Provision of additional dedicated servers and a backup power system for improved data security and continuity of activities within SOPAC. As the work programme of the Secretariat expands so does the requirements for adequate and secure storage for digital data. SOPAC currently also acts as a repository for certain regional databases and as a backup for certain national data collections. Adequate capacity and security are critical issues. Although data security and access are vitally important for operations at the Secretariat, SOPAC suffers significant downtime on an annual basis due to intermittent power cuts and a generally unreliable FEA supply. These power cuts are detrimental to electronic equipment and data holdings and a reliable back-up power system to maintain critical infrastructure is essential and has been since 2000.
- © Development of capacity in the use of ARC-GIS, and ArcView within SOPAC is considered necessary to address the needs of the Northern Pacific member countries who through their association with the United States, have from the outset been users of ESRI products. However within SOPAC, MapInfo remains the standard software platform for GIS applications and for the majority of member countries. Hence, this has been a focal area for the provision of training especially within the EDF8/9 Project activities as well as for other areas of intervention within SOPAC programmes.



Waste oil drums at power house plant, Tarawa, Kiribati.

"More needs to be done with available resources to tackle energy problems, especially rising fuel costs. The first step we need to take is to do more with the energy we are already using. Biofuels also can make an important contribution to energy security and supply but they must be economically viable and environmentally sustainable. Oils from coconuts for example, and ethanol from sugar cane and starchy crops like cassava can help replace up to 30 percent of our fossil fuel usage in the region." SOPAC Energy Adviser, Jan Cloin

Background

SOPAC, through the Community Risk Programme (CRP), is committed to working with officials and communities around the Pacific to strengthen the ability of countries to protect people as much as possible from the impact of natural and man-made disasters.

Following the decision by Council in Apia to approve the 'Pacific Regional Framework for Action for Building Safer and more Resilient Nations and Communities to Disaster 2005-2015', and endorsement by Pacific Leaders in Papua New Guinea in October 2005, the CRP has focussed much of its attention on assisting member countries develop national action plans consistent with the framework.

A major part of the process was to facilitate a partnership meeting in Suva in February 2006 at which it was decided to establish a Pacific Regional Disaster Risk Management Partnership Network. This network currently consists of about 30 members who have committed to working together to assist Pacific Island Countries develop and implement disaster risk reduction and disaster management national action plans that will support the Pacific Plan strategy (Kalibobo Roadmap) and national ownership of the regional framework for action.

Summary of Key Activities

Strengthening Resilience to Disasters

Project managed component one of the Asian Development Bank (ADB) Cook Islands Disaster Management and Mitigation Project over nine months. This included technical, institutional and training support and has significantly boosted the ability of the Cook Islands to protect local communities from the impact of natural disasters. New disaster risk management arrangements have been approved and the national emergency coordination office has been restructured and now located within the Department of the Prime Minister. Training for increased outer-island awareness of the new arrangements has also taken place.

- © Reviewed Marshall Islands' national disaster management arrangements.
- © Facilitated preparation of a Cyclone Response Plan for Niue.
- © Participated in bilateral discussions and provided technical support to national disaster management projects in Samoa, Tonga and Solomon Islands.



Impact on the SDA church in Matavera Village, Rarotonga, of Cyclone Meena that struck the Cook Islands on 6 February, affecting most of the northern part of the island, including the main town of Avarua.

- Continued to strengthen emergency communications in member countries through a partnership with Emergency Management Australia. This resulted in repairs to EMWIN systems in Fiji, Tonga and Solomon Islands and the completion of the installation of radio equipment in Vanuatu.
- Provided technical support to the development of a joint Australian Bureau of Meteorology / Emergency Management Australia proposal to conduct early warning capacity assessments in Fiji and Tuvalu.
- Provided support to Fiji to develop a funding proposal to strengthen national disaster management arrangements.
- Strengthened the capacity of the fire services in Fiji, Samoa, Tonga and Vanuatu by providing technical support and resources through partnership with the Australasian Fire Authorities Council.
- Facilitated a planning meeting in partnership with the Fiji National Fire Authority to develop a strategic plan for the newly-established Pacific Islands Fire Service Association (PIFSA).
- Provided training support to eight TAF/OFDA regional and national training courses, further enhancing skills and awareness of disaster response.
- Provided technical support and participated as exercise reviewers to the development and conduct of a national emergency operational exercise in Vanuatu.
- Supported the Pacific Wave Exercise 2006; managed by team members of the IGC/PTWS. The region-wide tsunami exercise targeted early warning communication systems and involved SOPAC members Fiji, Cook Islands, Niue, Papua New Guinea, Samoa, Solomon Islands and Tonga.

Mitigating the Effects of Hazards

- Developed a participants guide for EVI training.
- Commenced the development of a regional information database on hazards in conjunction with UNDP, UNOCHA and the IFRC.
- Provided support to the development of regional early warning and regional risk assessment projects which will commence in 2007 and aims to address early warning requirement for all Pacific countries.
- Collaborated with the hazard and risk components of the EU Project on Reducing Vulnerability in Pacific ACP States to ensure effective synergies.
- Built an extensive database from baseline data for use in a comprehensive hazard and vulnerability analysis in Lae, Papua New Guinea.
- Worked with the Pacific Disaster Center, Fiji, Vanuatu and Papua New Guinea to develop a Tsunami Awareness Kit.



Debris left after sea surge, Republic of Marshall Islands.

Tsunami workshop to boost community safety

Saving lives and protecting communities in the Pacific through better warning services and communication was the focus for regional officials who participated in the North Pacific Tsunami Awareness Training Workshop in Guam in August.

Risk assessment specialists from SOPAC worked in partnership with the US National Oceanic and Atmospheric Administration (NOAA) and the International Tsunami Information Centre (ITIC) to deliver an important awareness and education workshop.

“Unfortunately, the greater Pacific region is vulnerable to tsunamis so boosting awareness and helping to educate people about how to respond is absolutely critical to saving lives and protecting local communities,” SOPAC Risk Assessment Specialist, Mr Michael Bonte said.

The four-day workshop provided officials with a better historical understanding of tsunamis in the Pacific and Indian oceans and discussed communication technology and dissemination techniques.



North Pacific Tsunami Awareness Conference, Guam.

“Enhancing the ability of officials to quickly and effectively relay the warning is a matter of life and death. People throughout the region must also be educated about how to respond to a tsunami – their lives may depend on it,” Mr Bonte said.

From 1901 to 2001, more than 100 tsunamis claimed lives around the Pacific Ocean, nine of which caused widespread destruction.

Tongan officials to tackle disaster threats

More than twenty local officials received vital training in disaster management techniques to boost Tonga’s response to the ongoing threat of natural disasters, including earthquakes, tsunamis and cyclones.

Disaster management specialists from SOPAC and The Asia Foundation (TAF) worked with Tongan National Disaster Management Office (NDMO) Director, Maliu Takai, to deliver training in Nuku’alofa in August.

“Tonga, like many of the Pacific Island countries, is vulnerable to a number of severe natural hazards so disaster management training is crucial to saving lives and protecting local communities,” TAF’s Programme Director for the USAID Office of US Foreign Disaster Assistance, Pacific Disaster Risk Management Training Programme, Ms Kathryn Hawley said.

The one-week training jointly coordinated by the NDMO and the Tonga Red Cross Society, provided officials with an introduction to disaster risk management concepts and skills to conduct initial damage assessments.

“Enhancing the effectiveness of officials in a disaster can save lives and the ability to effectively assess will greatly assist in the recovery of a community,” Ms Hawley said.

The course, funded by USAID and implemented by TAF in partnership with SOPAC, enabled participation from key agencies: police, fire, environment, health, education, defence and the Red Cross, as well as representatives from the Prime Minister’s Office and the Ministry of Works.

In May, this year, an earthquake of magnitude 7.8 rocked parts of Tonga prompting some fears of a tsunami and another earthquake in August off the coast of Nuku’alofa registered 6.1.

Pacific top cops to tackle disaster threats

The ability of regional police to protect lives has been boosted through critical disaster management training that has broadened the role of police in the Pacific in tackling natural disasters.

As part of the Police Leadership Development Programme, disaster risk management specialists from SOPAC and The Asia Foundation, delivered comprehensive training in Suva in August to more than 15 senior police officers from around the region.

“Unfortunately, many countries in the Pacific are vulnerable to natural disasters and police are usually the only organisation available around the clock to respond. The ability of the police to help the community will be greatly enhanced by disaster preparedness and risk reduction activities,” SOPAC Community Risk Programme Manager, Mr Alan Mearns said.

The workshop was part of a two-week programme, jointly funded by SOPAC and the Pacific Regional Policing Initiative, which aimed to raise police awareness about their role in assisting communities prepare and respond to disasters such as cyclones and tsunamis.

“The primary role of police is to protect life and property but it is often difficult to remove a person from a disaster prone area. This training will help police to educate the community about the danger of disasters and improve coordination of key agencies in responding to disaster threats,” Suva Central Police Station Superintendent Ram Chetty said.

“Disaster risk management training broadens the understanding of police in the region on the need to strengthen community preparedness and risk reduction and is educating officers from across the Pacific, including Vanuatu, Samoa, Papua New Guinea, Kiribati, the Federated States of Micronesia and the Cook Islands,” Mr Mearns said.

The Kit has been introduced to a wide range of stakeholders in Fiji and made available to member country NDMOs.

- © Worked with PIEPSAP to conduct a disaster response and mitigation plans gap analysis for public utilities.
- © Facilitated a Tsunami Awareness Conference in Guam in partnership with the National Weather Service of NOAA and the ITIC. The workshop targeted emergency managers and weather officers from the North Pacific US Affiliated Pacific Island Countries and Territories. SOPAC provided disaster specialists, project officers and financial support for national emergency managers from Palau, Republic of Marshall Islands, and Federated States of Micronesia and for state emergency managers from Yap, Pohnpei, Chuuk and Kosrae.

Mainstreaming Disaster Risk Management

- © Completed final editing and publication of the Pacific Regional Framework for Action.
- © Facilitated the establishment of the Pacific Regional Disaster Risk Management Partnership Network.
- © Provided support to Vanuatu to develop the region's first disaster risk management national action plan.
- © Worked with TAF/OFDA to develop a CHARM training manual.
- © Collaborated with the Pacific Regional Policing Initiative to develop a disaster risk management unit for the Police Leadership Development Programme.



Flooding in Apia, Samoa.

"The vulnerability of the entire Pacific region to natural disasters has seen national governments working closely together with regional organisations, such as SOPAC, to develop critical disaster risk reduction and disaster management plans." Community Risk Programme Manager, Alan Mearns

- © Collaborated with the United Nations Volunteer Programme to bring UNVs to the region to strengthen disaster risk reduction in Fiji, Tonga and Vanuatu.
- © Developed a CHARM training manual for Kiribati. This manual is now being used on the Strengthening Decentralized Governance in Kiribati Project and translation into the local language is being finalised.

Issues and Opportunities

1) *Pacific Regional Framework for Action for Building Safer and more Resilient Nations and Communities to Disasters 2005 – 2015* —

Following the approval by Council this document was subsequently endorsed by Pacific Islands Forum Leaders at the 36th Pacific Leaders Forum meeting held in Papua New Guinea in October 2005. The priority for the Community Risk Programme is to now assist member countries to develop and implement national action plans consistent with this framework in support of the mainstreaming of disaster risk reduction and disaster management.

2) *Strategy for an all-hazards early warning system* — The CRP has contributed to a joint Australian Bureau of Meteorology/Emergency Management Australia and Geoscience Australia proposal through the AusAID Pacific Governance Support Programme. Funds will be used to conduct a regional risk assessment as well as capacity assessments for tsunami and multi-hazard warnings in member countries.

3) *Collaborative partnership with USP to develop accredited disaster risk management training courses in the region* — Discussions have taken place and are continuing between the CRP and USP.

4) *Attachment of NDMO staff to the Community Risk Programme* — Preliminary discussions have taken place with a number of

member countries for short-term attachments to the CRP. These attachments are expected to commence in 2007 for a period of 2 to 4 weeks to allow participants the opportunity to build relationships with CRP staff and to broaden their understanding of national and regional issues.

5) *Pacific Disaster Risk Management Partnership Network* — In response to Council's call to address the priority implementation of the Pacific Regional Framework for Action, SOPAC facilitated a planning meeting in February 2006. The meeting established a regional disaster risk management partnership network with the Secretariat as partnership facilitator. Thirty founding members committed to working in a more coordinated manner to assist countries develop and implement national action plans in accordance with the Pacific Regional Framework for Action.

6) *Developing and Implementing National Action Plans* — Under regional partnership network arrangements, Vanuatu is the first country to benefit from this new initiative with PIFS, SPREP, UNDP and WB working with the Secretariat. The development of these plans is being carried out in a number of stages commencing with a visit by the regional advocacy team led by Dr Langi Kavaliku to gain necessary political support. Members of the partnership network are providing support for national consultations and technical assistance to national task forces that will develop plans.

7) *Developing and distributing a regional DRM information database* — A joint partnership between SOPAC, UNDP, UNOCHA and IFRC is developing a comprehensive disaster database. The database will include disaster risk reduction and disaster management guidelines; past disasters; current hazards, current plans and initiatives; outreach examples; research; and other related issues. The database will be housed at SOPAC and available online as well as on CD and DVD for all member countries.

"For Vanuatu, SOPAC has been there a long time. Evidence of SOPAC is there for all three programme areas and we are happy with the services of SOPAC. The CRP is working with our NDMO and people expect to see us move forward. The action plan is the best point of entry for our development plan and we are happy for SOPAC to venture into other areas. This plan is a platform for harmonising other sectors and we want to do the same with other sectors, water, lifelines and oceans and islands. SOPAC supports good governance of small island nations." Director Vanuatu National Disaster Management Office, Mr Job Esau



Earthquake damage in Ha'apai, Tonga.

8) Tsunami and multi-hazard early warning project

— It is anticipated that the joint Australian Bureau of Meteorology and Emergency Management Australia project for capacity assessment and building of tsunami and multi-hazard warnings in member countries will commence implementation with Fiji and Tuvalu as pilot countries. Recent regional tsunami alerts and the Pacific Wave exercise have reinforced the urgent need to address the issue of early warnings systems.

9) ACP/EU Disaster Facility

— The Secretariat has recently submitted a proposal for funding through the ACP/EU Disaster Facility. This global initiative is supporting six ACP sub-regions. Funding is expected in early 2007 and will provide the necessary support to effectively coordinate the development of disaster risk reduction and disaster management national action plans in member countries.

These plans will contribute to operationalising the Pacific Plan, in particular the key initiatives of the Kalibobo Roadmap. This aims to strengthen policies and plans for the mitigation and management of natural disasters; assist with the implementation of the Pacific Regional Framework for Action for Building Safer and more Resilient Nations and Communities to Disasters; and consolidate national priorities being implemented through the use of the remaining EDF9 'B' Envelope funds, under the national indicative programmes of Pacific ACP States.

Programme Resources

A critical issue for the CRP, and one highlighted by the 2005 PMEG, is the current workload, staffing and budget arrangements. The recent appointment and transition of a new manager and the recent departure of the Disaster Mitigation Adviser meant that the programme needed to restructure at a time when it was also taking on the role of facilitating the regional partnership network. This provided an opportunity for the new manager to refocus programme priorities and recruit appropriate technical and professional staff to ensure programme momentum continued to address the challenge of mainstreaming disaster risk reduction and disaster management through the partnership initiative.



Tsunami Awareness Kit — an information resource for the Pacific Islands.

TAG-STAR-PMEG – a suite of tools unique to SOPAC

In official language the Pacific Islands Applied Geoscience Commission (SOPAC) comprises:

- 1) a Governing Council of member country representatives;
- 2) a Secretariat; and
- 3) a technical advisory group (TAG for short).

In 1997, and in rhetoric the Fiji Minister of Lands and Mineral Resources, Ratu Timoci Vesikula, at the opening of the SOPAC 26th Session in Nadi described SOPAC as a tool “we sharpen, oil and keep in good condition.”

“In fact, SOPAC is a set of tools, one of which is STAR,” Dr Keith Crook, then Chair of STAR elaborated further.

STAR was the brainchild of the 3rd arm of SOPAC, TAG, which has the institutionalised “responsibility to provide advice requested by Council on the technical, scientific, training, research and other relevant aspects of the work of the Commission.”

It was in the tendering of this “technical, scientific, training and research” advice by TAG to the Governing Council that gave rise to the formulation of STAR, the Science, Technology and Resources Network, as a mechanism to “focus attention upon significant scientific problems of the region.” Established first as a working group with a bent to the deeper study of the geological and geophysical aspects of deepsea minerals (including hydrocarbons); STAR has evolved into the geoscientific network that it is today demonstrating that the study of the earth (and its oceanic realm) involves a broad sweep of sciences. It also includes physical and chemical oceanography, meteorology, marine biology, ecology, and aspects of earth-related social sciences such as urban geography; to name a few.

In the aftermath of a major restructuring of the way the Secretariat would execute Commission business in the 21st Century, the TAG decreased in its role and the STAR increased, probably because its structure was less formal. STAR is first and foremost

“Very impressed that SOPAC have asked for this as not many people invite this kind of transparency and management accountability. This is a self-imposed review by SOPAC, they did not need to do this. It takes lots of guts. SOPAC want to show they operate in a transparent manner, they listened to our review and implemented lots of our recommendations from last year.”
PMEG-OIP Chair, Gary Greene



“STAR is about applied science solutions in the Pacific and how we can take these right down to the village level to improve people’s lives. All scientists are here because they are committed to helping communities throughout the Pacific region better use their environmental resources.” Chair of STAR, Victoria University Associate Professor in Geology, John Collen



a gathering of scientists to talk about their pet projects; but the Chairs of STAR have been noting the increasing trend towards the application of the sciences to the problems of the Pacific and it is clear that STAR has matured into its role of mobilising excellent and multi-disciplinary science and bringing it to bear on the SOPAC agenda; completely vindicating the premise upon which it was established. The major concern expressed at TAG’s decreased role was that the Secretariat, in its restructure of 2000/2001, had strategised itself into losing an independent body of scientific counsellors who would without prejudice ‘judge’ the science practised by the Secretariat and that this was a disservice to the Commission’s member states.

To regain that independent group of scientific counsellors, the Governing Council approved the Secretariat’s submission in 2003 for the establishment of Programme Monitoring and Evaluation Groups (PMEG) for each branch of the burgeoning SOPAC Work Programme. Beginning in 2005, three PMEG’s – one each for the work programmes reported on in this document, began work in carrying out a “transparent and independent” evaluation of outputs and whether these outputs over time contributed to a programme meeting its goals.

Thus between STAR and TAG, and now PMEG, the Governing Council has access to an independent body of highly-qualified people well versed on SOPAC’s work, at virtually zero cost. The SOPAC Governing Council has many times acknowledged that this was a unique circumstance whereby science and policy met and found common ground to advance the Commission members’ interests.

“SOPAC Council has an invaluable resource in the many experienced and respected international scientists who attend the STAR and SOPAC meetings and form the Technical Advisory Group (TAG),” said Professor John Collen of the Victoria University of Wellington; current Chair of STAR.

The sharp and well-oiled tools of SOPAC: TAG and STAR have been weighed on the balances and re-recorded the confidence of the Commission’s Governing Council and Secretariat to provide the guidance necessary in the proper acquittal of its programmes of work.



Participants at the 35th Session of SOPAC, Honiara, Solomon Islands.

Appendix 1: SUMMARY REPORT OF 2006 DONOR SUPPORT

Source of funds	Grand Total	Ocean & Islands	Community Lifelines	Community Risk	Corporate Services	Activity
European Union EDF 8	3,902,889	1,300,681	1,701,574	731,192	169,442	Reducing Vulnerability of Pacific ACP States.
Australia Annual Grant	2,417,051	964,719	744,646	707,656		Various activities funded.
European Union EDF 9	1,854,043	500,000	848,936	446,809	58,298	Reducing Vulnerability of Pacific ACP States.
New Zealand Annual Grant	1,041,279	207,602	607,941	225,736		Various activities funded.
Government of Denmark/EU	628,203		628,203			PIEPSAP Project.
New Zealand – Special Grant	581,503		435,137	146,366		Regional Hydrological Training Programme.
UNDESA	468,877		318,877	150,000		Demand Side Management Project.
Fiji	325,027					Fiji Government Grant.
Taiwan (ROC)	180,597	48,061	132,536			Regional Aggregates Workshop; World Water Day Activities; Promotion of water, sanitation and hygiene activities.
European Union – EU	164,440		164,440			Pacific Program for Water Governance.
Emergency Management Australia	144,561			144,561		Emergency Communications for Member Countries; Support for Disaster Reduction Conference, Kobe; 12th Pacific Regional Disaster Meeting.
Australia – AVI	120,250		120,250			Water Engineer position – Australian Volunteers International.
United Kingdom (ODI)	113,600	113,600				Resource Economist.
United States/TAF-OFDA	108,643			108,643		Development of Emergency Disaster Response Capabilities, Kobe Conference on Disaster Reduction.
UNOPS/UNDP	105,000		105,000			Fiji Resilience Project (Energy); CocoGen Project.
Australian Marine Science & Technology – AMSAT	95,641	95,641				South Pacific Sea Level and Climate Monitoring Project – SPSLCOMP III.
UNESCO-IOC	73,940	73,940				PI-GOOS Coordinator and activities.
Centre for Agriculture and Rural Cooperation – CTA	60,000		60,000			Pacific Energy and Gender Network (PEG).
Global Environment Fund – GEF	50,000		50,000			Sustainable water management in Pacific Island States.
Japan Water Forum	50,000		50,000			4WWF Activities.
Commonwealth Fund for Technical Cooperation – COMSEC	46,339	46,339				Support for Maritime Boundaries Training Courses, Fiji and Samoa.
UN-ISDR	10,000			10,000		World Disaster Day activities, ISDR Information Guide.
Asian Development Bank - ADB	8,000		8,000			Support to member states – ICT/GIS Development.
World Bank	7,500			7,500		Disaster Management Project – Tonga.
ACIAR – Australian Centre for International Agricultural Research	5,000		5,000			Equitable management of groundwater.
Total Donor Support	12,512,383	3,350,583	5,980,540	2,678,463	227,740	
Bilateral Support						
Federated States of Micronesia	12,039	12,039				Workshop on EIA for aggregates.
Kiribati – Bilateral	37,947			37,947		CHARM, Adaptation to Climate Change.
Cook Islands – Bilateral	31,663	31,663				Mapping of Avatiu Harbour, foreshore.
Total Bilateral Support	81,649	43,702		37,947		

Appendix 2: REPORTS & PUBLICATIONS UPDATE (as at 30 September 2006)

CORPORATE PUBLICATIONS

Proceedings of the Thirty-fourth Session, hosted by the Government of the Samoa in Apia, Samoa, 24-30th September 2005.

Annual Report Summary 2005.

TECHNICAL REPORTS

- 340 Preliminary Report on an assessment carried out in areas of Vava'u affected by Tropical Cyclone Waka, Tonga. RESTRICTED.
- 377 Pacific Islands Regional Maritime Boundaries Information System (PIRMBIS) – Niue Maritime Boundaries Project. CONFIDENTIAL.
- 378 Pacific Islands Regional Maritime Boundaries Information System (PIRMBIS) – Cook Islands Maritime Boundaries Project. CONFIDENTIAL.
- 383 Economic assessment of the true costs of aggregate mining in Majuro Atoll, Republic of the Marshall Islands.
- 385 Harbour surveys Avatiu, Avarua and Avana, Rarotonga and Arutanga, Aitutaki, Cook Islands – Preliminary Data Release. RESTRICTED.
- 390 SOPAC Coastal Protection Feasibility Study, Final Report. Consultants Report (GHD Pty Ltd). RESTRICTED.
- 391 Pacific Islands Regional Maritime Boundaries Information System (PIRMBIS) – Tuvalu Maritime Boundaries Project. CONFIDENTIAL.
- 392 An evaluation of the biofuel projects in Taveuni and Vanua Balavu, Fiji Islands.
- 393 CocoGen – Feasibility study into the use of coconut oil fuel in EPC Power Generation.

- 394 Multibeam survey of new Kinoya sewer outfall, Laucala Bay, Fiji Islands. RESTRICTED.
- 395 Water resources management in Aitutaki, Cook Islands.
- 396 Report on groundwater investigations on Caqalai and Moturiki islands, Viti Levu, Fiji, 19-30 June 2006.

PRELIMINARY REPORTS

- 142 CocoGen debriefing report, Samoa.
- 144 The geology, mining history and phosphate resources of Banaba, western equatorial Pacific, Republic of Kiribati. CONFIDENTIAL.
- 145 Preliminary Report on Multibeam survey of new Kinoya Sewer Outfall, Laucala Bay, Fiji Islands. RESTRICTED.

MISCELLANEOUS REPORTS

- 606 Literature and data review – Suva Harbour – Rokobii Project. (Report accompanies data package for commercial interests. Appendices are restricted to Fiji Government & Rokobii Project developers.)
- 610 Pacific Islands Regional Maritime Boundaries Project : Future Directions. (Paper prepared for the World Maritime Technology Conference (WMTC), Queen Elizabeth II Conference, London, 6-10 March 2006)
- 613 Disaster Risk Reduction and Disaster Management – A Framework for Action 2005-2015. Building the Resilience of Nations and Communities to Disasters. (An Investment for Sustainable Development in the Pacific Islands Countries)
- 614 Pacific Islands Regional Maritime Boundaries Information System [PIRMBIS] – Technical Instructions Manual. RESTRICTED.

- 615 Proceedings of the Regional Strategic Planning and Awareness Raising Workshop – Pacific Energy and Gender Network (PEG), (5-9 December 2005, Tanoa International Hotel, Nadi, Fiji).
- 619 Proceedings of the Partnership in Developing a Regional Implementation Strategy Workshop, 9-10 February 2006. (Mainstreaming Disaster Risk Reduction and Disaster Management in Pacific Island Countries).
- 621a Abstracts of papers presented at the Science, Technology and Resources Network (STAR) Session 2006. Pre-Session Version. (23rd STAR Session is held in conjunction with the SOPAC 35th Session (20-28 September), Honiara, Solomon Islands).
- 621b Abstracts of papers presented at the Science, Technology and Resources Network (STAR) Session 2006. Post-Session version. (23rd STAR Session was held in conjunction with the 35th SOPAC Session).
- 54 TUVALU Technical Report – Coastal change analysis using multi-temporal image comparisons, Funafuti Atoll.
- 57 Solomon Islands Country Mission and Technical Advisory Report: Stakeholder Consultations and Aggregates Source Assessment in Honiara and Ghizo Island, Western Province.

Fact Sheets

- 1 Tropical Cyclones
- 2 Earthquakes
- 3 Tsunami
- 4 Landslides
- 5 Volcanos
- 6 Floods
- 7 Coastal Erosion

EU-SOPAC PROJECT REPORTS

- 47 VANUATU Country Mission and Technical Advisory Note – Coastal management and aggregates assessment in selected parts of southwestern Efate Island. 3-17 October 2004.
- 48 VANUATU Technical Report on geological and geo-technical assessment of the Quoin Hill volcanic rocks, Efate, Vanuatu, as a potential aggregates source.
- 51 VANUATU – Country Mission Report – 28 June – 12 July 2005.
- 52 VANUATU – Country Mission Report – 24 November – 4 December 2005.
- 53 KIRIBATI Technical Report – Analysis of coastal change and erosion – Tebunginako Village, Abaiang.

JOINT CONTRIBUTIONS REPORTS

- 183 South Pacific Sea Level & Climate Monitoring Project (Phase III) Survey Report – Precise Differential Levelling – Vanuatu, May 2004. (Australian Government (AusAID, AMSAT, BOM, NTF)/SOPAC) (31 pages)
- 184 South Pacific Sea Level & Climate Monitoring Project (Phase III) Survey Report – Precise Differential Levelling – Kiribati, June 2004. (Australia Government (AusAID, BOM, NTF, AMSAT)/SOPAC) (24 pages)
- 185 South Pacific Sea Level & Climate Monitoring Project (Phase III) Survey Report – Precise Differential Levelling – Cook Islands, August 2004. (Australian Government (AusAID, AMSAT, NTF, BOM)/SOPAC) (29 pages)
- 186 South Pacific Sea Level & Climate Monitoring Project (Phase III) Survey Report – Precise Differential Levelling – Samoa, September 2004. (Australian Government (AusAID, AMSAT, NTF, BOM)/SOPAC)

RESTRICTED CIRCULATION REPORTS

PIEPSAP Project Reports

- 33 National Renewable Energy Policy Framework – Tonga. Inception Report. September 2005.
- 34 Quarterly Progress Report, 3rd Quarter 2005. October 2005.
- 35 National Energy Policy and Rural Electrification Policy Workshop, 21-26 August 2005, Aiotau (Milne Bay Province), Papua New Guinea.
- 36 National Energy Policy – Consultation Workshop, 28 November – 2 December 2005, Honiara, Solomon Islands.
- 37 Niue National Energy Policy.
- 38 Niue National Energy Action Plan.
- 39 National Energy Policy Framework -- Solomon Islands.
- 40 Annual Work Plan 2006.
- 41 Pacific Islands Energy Policy and Strategic Action Plan (PIEPSAP) Annual Report 2005.
- 42 National Energy Policy and Rural Electrification Policy -- Second Workshop, 5-7 April 2006.
- 43 Request for Quotation – Review of Solomon Islands Electricity Act and Rural Electrification Framework.

- 44 Assistance to the Cook Islands Government in the Review of the National Energy Policy and Technical Assistance to the Energy Division – Work Plan Proposal.
- 45 Federated States of Micronesia, Republic of the Marshall Islands & Republic of Palau – Back-to-Office Report.
- 46 Vanuatu National Consultation – Back to Office Report.
- 47 Quarterly Progress Report – 2nd Quarter 2006.
- 48 Summary Record of the PIEPSAP Mid-Term Review Meeting held on 28 August 2006 in Nadi, Fiji.

This series of reports was created in 2005 in association with the Pacific Islands Energy Policies and Strategic Action Plan (PIEPSAP Project) and has never been listed in this document. In the Annual Report Summary reporting period for 2005, 33 project reports were released online.

Other newsletters

- Mission Reports – 15 issues
- GIS & Remote Sensing Newsletter – 1 issue
- Pacific Energy News (PEN) – 2 issues
- SOPAC NewsUpdate – 2 issues
- Snapshots (CRP News bulletin) – 8 issues
- WAT's News (Water Section news) – 1 issue
- Pacific Partnership Initiative on Sustainable Water Management – 5 issues

Appendix 3: SECRETARIAT STAFF LIST (as at September 2006)

POSITION	NAME	COUNTRY OF ORIGIN	DATE JOINED SOPAC	CONTRACT START	CONTRACT END
DIRECTORATE					
Director	Cristelle Pratt	New Zealand	May 2000	February 2004	February 2007
Deputy Director	Bhaskar Rao	Fiji	May 2004	September 2005	September 2008
Executive Assistant	Lilita Waradi	Fiji	April 1989	January 2004	December 2006
Communications Adviser	Shane Fairlie	Australia	July 2006	July 2006	July 2007
Project Assistant – SOPAC/EU Project	Aarti Naidu	Fiji	May 2002	May 2006	December 2007
OCEAN & ISLANDS PROGRAMME					
Manager Ocean & Islands	Mary Power	Australia	January 2006	January 2006	January 2009
Senior Adviser – Physical Oceanography	Jens Kruger	United Kingdom	September 2004	September 2004	September 2007
Senior Adviser – Resource Economist	Paula Holland	Australia	March 2006	March 2006	March 2009
Senior Adviser – Marine Geophysics	Robert Smith	Australia	May 1988	July 2004	July 2007
Senior Adviser – Aggregates	Akulia Tawake	Fiji	October 2003	October 2003	October 2006
Senior Adviser – Geoscience Training	Vacant				
Senior Adviser – Marine Geoscience	Vacant				
Adviser – Technical (Electronics)	Simon Young	Fiji	January 1993	January 2005	January 2008
PL-GOOS Coordinator	Vacant				
Adviser – Aggregates & Coastal Process	Arthur Webb	United Kingdom	July 2004	July 2004	July 2007
Programme Assistant – Ocean & Islands	Frances Dobui	Fiji	October 2003	October 2003	October 2006
Resource Economist	Allison Woodruff	Canada	October 2005	October 2006	October 2008
Project Offi cer 1 – Technical (Marine)	Vacant				
Project Offi cer 2 – Technical (Surveying)	Andrick Lal	Fiji	August 2001	August 2004	August 2007
Project Offi cer 3 – Technical (Geoscience)	Sekove Motuwaca	Fiji	April 1980	January 2004	December 2006
Project Offi cer 4 – Technical (Electronics)	Peri Musunamasi	Fiji	June 1989	January 2004	December 2006
Project Offi cer 5 – Technical (Mechanics)	Setareki Ratu	Fiji	October 1986	January 2004	December 2006
Project Offi cer 6 – Maritime Boundaries	Emily Atack	Fiji	May 2004	October 2003	October 2005
Project Offi cer 7 – Geoscience Training	Vacant				
EU Attachment	Naomi Bribo-Atauea	Kiribati	July 2004	July 2004	December 2006
COMMUNITY LIFELINES PROGRAMME					
Manager Community Lifelines	Paul Fairbairn	New Zealand	January 1998	September 2006	September 2009
Adviser – ICT/CLP	Siaosi Sovaleni	Tonga	October 2005	October 2006	October 2008
Water Resource Specialist	Stephen Booth	United Kingdom	February 2003	February 2003	February 2006
Resources Specialist	Vacant				
Senior Adviser – EU-GIS and Remote Sensing	Wolf Forstreuter	Germany	January 1999	January 2006	December 2007
Senior Adviser – EU-ICT Specialist	Franck Martin	France	September 1993	January 2006	December 2007

STAFF LIST ... continued

Manager – Water, CLP	Marc Overmars	Netherlands	April 2000	January 2006	December 2009
Adviser – Energy(PIEPSAP Project)	Anare Mataktiviti	Fiji	February 2000	September 2004	September 2007
Adviser – Water Resources,Supply & Sanitation	Vacant				
UN Associate Expert	Jan Cloin	Netherlands	November 2003	November 2003	November 2006
Project Manager – PIESAP Project	Gerhard Zieroth	Germany	August 2004	August 2004	August 2007
Water Engineer	Mathias Kleppen	Norway	March 2006	March 2006	March 2008
Adviser – Energy	Rupeni Mario	Fiji	October 1998	April 2005	April 2008
Regional Project Development Officer	Rhonda Bower	Fiji	November 1998	July 2006	July 2008
Programme Assistant – Community Lifelines	Pooja Pal	Fiji	May 2006	May 2006	May 2009
Programme Officer – Water Quality Monitoring Capacity	Tasleem Hasan	Fiji	March 2005	June 2006	June 2008
Project Officer 8 – ICT Network and Security	Graeme Frost	Fiji	March 1992	January 2004	December 2006
Project Officer 9 – WASH Officer	Kamal Khatri	Fiji	February 2005	February 2006	February 2007
Project Officer 10 – Water Sanitation	Alena Lawedrau	Fiji	May 2003	May 2006	May 2007
Project Officer 11 – Energy	Koin Eluati	Kiribati	June 2006	June 2006	June 2007
Project Officer 12 – PIEPSAP	Yogita Bhikabhai	Fiji	January 2002	September 2004	September 2007
Project Officer 13 – Water Safety Plans	Davendra Nath	Fiji	January 2006	January 2006	January 2009
Project Officer 14 – Water Partnerships	Sanjeshni Naidu	Fiji	August 2005	August 2006	August 2007
Project Officer 15 – GIS & Remote Sensing	Elizabeth Lomani-Whippy	Fiji	February 2004	February 2006	December 2007
Project Officer 16 – GIS/RS & ICT	Joy Papao	Solomon Islands	June 2004	June 2006	June 2007
Project Officer 17 – Water Sector	Arieta Navatoga	Fiji	October 2003	March 2006	March 2009
Temporary Attachment Water Resources	Linda Yuen	Fiji	June 2005	August 2006	August 2007
Project Water Assistant	Komal Raman	Fiji	January 2006	January 2006	January 2007
Assistant Project Officer I – Water Quality	Vacant				
Assistant Project Officer II – Water & Sanitation	Vacant				
EU Intern – Fiji	Vilisi Tokalauvere	Fiji	February 2004	February 2006	February 2007
COMMUNITY RISK PROGRAMME					
Manager Community Risk	Alan Meams	Australia	June 2000	June 2003	December 2006
Risk Analyst Specialist	Michael Bonte	Germany	June 2003	June 2006	December 2007
Disaster Mitigation Adviser	Vacant				
Programme Director – PDRMP	Kathryn Hawley	USA	February 2001	August 2006	May 2008
Adviser Sustainable Development	Netatua Prescott	Tonga	August 2004	August 2004	August 2007
Adviser – Hazards Assessment	Litea Blukoto	Fiji	April 2003	July 2004	July 2007
UN Associate Expert	Noud Leenders	Netherlands	November 2003	November 2003	November 2006
TAF/OFDA Training Support Adviser	Tukatara Tangi	Cook Islands	September 2004	August 2006	May 2008
TAF/OFDA Materials Development Specialist	Emele Matawaqa	Fiji	August 2006	August 2006	May 2008
Research and Planning Officer	Vacant				
Programme Assistant – Community Risk	Asenaca Rokamanalagi	Fiji	April 2005	April 2006	April 2007
Content Manager – Disaster Risk Management Database	Jutta May	Germany	August 2006	August 2006	August 2007

STAFF LIST ... continued

POSITION	NAME	COUNTRY OF ORIGIN	DATE JOINED SOPAC	CONTRACT START	CONTRACT END
CORPORATE SERVICES					
Manager Corporate Services	Mohinish Kumar	Fiji	March 1988	September 2006	September 2009
Senior Adviser – Technical Editor	Mereseini (Lala) Bukarau	Fiji	November 1985	September 2006	September 2009
Accountant	Lucia Kafoa	Fiji	May 2006	May 2006	May 2009
Adviser – ICT/CS Technical	Sakao Manoa	Tuvalu	January 2004	August 2005	August 2008
Conference & Travel Officer	Laisa Baravilala-Baosa	Fiji	July 1987	May 2006	May 2009
Administration Officer	Karen Datta	Australia	July 2001	July 2004	July 2007
Finance Services Officer	James Ram	Fiji	May 2000	January 2006	December 2008
Administrative Assistant – SOPAC/EU Project	Subha Ram	Fiji	September 2004	January 2006	December 2007
Administrative Assistant	Arishma Lal	Fiji	May 2006	August 2006	August 2007
Receptionist/Clerk	Unaist Bainiloga	Fiji	February 1987	January 2004	December 2006
Driver/Clerk	Enele Gaunavou	Fiji	July 1988	January 2004	December 2006
Office Assistant/Cleaner	Salestino Niu Daurewa	Fiji	September 1987	January 2004	December 2006
Project Officer 18 – Publish./Graphic Arts	Reuben Vulawalu	Fiji	April 2001	March 2004	March 2007
Project Officer 19 – Library	Dorene Naidu	Fiji	September 2004	September 2004	September 2007
Project Officer 20 – Web Developer	Vacant				
Project Officer 21 – ICT Training	Avinash Prasad	Fiji	June 1999	January 2006	December 2006
Assistant Finance Officer I	Emi Nofaga	Fiji	August 2002	March 2005	March 2006
Assistant Finance Officer II	Asinate Nawamea	Fiji	December 2005	June 2006	June 2007
Security Officer	Cama Temo	Fiji	September 2002	January 2005	December 2006
Watchman/Cleaner	Ajay Chand	Fiji	December 2000	August 2006	August 2007
Assistant Project Officer III – Publications/Library	Elenoa Rokodi	Fiji	February 2003	February 2006	February 2007
Carpenter	Nand Kumar	Fiji	June 1998	January 2006	December 2006
Assistant Carpenter	Ajay Chand	Fiji	December 2000	August 2006	August 2007
Gardner	Are Watone	Fiji	March 1996	January 2006	December 2006

Appendix 4: LIST OF ACRONYMS

ACIAR	–	Australian Centre for International Agricultural Research	GA	–	Geoscience Australia
ADB	–	Asian Development Bank	GEF	–	Global Environmental Facility
ACP	–	African, Caribbean, Pacific	GeoCMS	–	GeoSpatial Content Management Server
AusSAT	–	Australian Marine Science and Technology Limited	GPA	–	Global Plan for Action for the Protection of the Marine Environment from Land-based Activities
APDIP	–	Asia-Pacific Development Internet Programme	GPS	–	Global Positioning System
APWF	–	Asia-Pacific Water Forum	GWP	–	Global Water Partnership
ASB	–	Archipelagic Straight Baselines	HELP	–	Hydrology for the Environment, Life and Policy
AusAID	–	Australian Agency for International Development	HYCOS	–	Hydrology Cycle Observing System
AVI	–	Australian Volunteers International	IAS (USP)	–	Institute of Applied Science
BCA	–	Benefit–Cost Analysis	ICG/PTWS	–	Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System
BOM	–	Bureau of Meteorology	ICT	–	Information and Communication Technologies
BoMA	–	Bureau of Meteorology Australia	ICU	–	[Pacific] Islands Climate Update (NZAID)
CESMG	–	Certificate of Earth Science and Marine Geology	IFRC	–	International Federation of the Red Cross and Red Crescent Societies
CFTC	–	Commonwealth Fund for Technical Cooperation	IHP	–	International Hydrological Programme (of UNESCO)
CHARM	–	Comprehensive Hazards and Risk Management	IOI	–	International Ocean Institute
CLP	–	Community Lifelines Programme	IPCC	–	Intergovernmental Panel on Climate Change
CRP	–	Community Risk Programme	IPRC	–	International Pacific Research Center
CSD	–	Commission on Sustainable Development	ISP	–	Internet Service Provider
CTA	–	Centre for Agricultural and Rural Cooperation	ITIC	–	International Tsunami Information Centre
DRM	–	Disaster Risk Management	IWRM	–	Integrated Water Resources Management
DRR	–	Disaster Risk Reduction	JWF	–	Japan Water Forum
DSM	–	Demand Side Management	KIGAM	–	Korea Institute of Geology, Mining and Minerals
EBM	–	Ecosystem-Based Management	LAN/WAN	–	Local Area Network/Wide Area Network
EDF	–	European Development Fund	LLEE	–	Live and Learn Environment Education
EMA	–	Emergency Management Australia	MSP	–	Medium Size Project
EMWIN	–	Emergency Managers Weather Information Network	MSWG	–	Marine Sector Working Group (of the CROP)
ENSO	–	El Niño Southern Oscillation	NDMO	–	National Disaster Management Office
EPC	–	Electric Power Corporation (Samoa)	NGO	–	Non-Government Organisation
ESRI	–	Environmental Systems Research Institute, Inc.	NHS	–	National Hydrological Services
EU	–	European Union	NIWA	–	National Institute for Water and Atmospheric Research (New Zealand)
EUEI	–	European Union Energy Initiative	NMS	–	National Meteorological Services
EVI	–	Environmental Vulnerability Index	NOAA	–	(US) National Oceanic and Atmospheric Administration
EWG	–	Energy Working Group	NOC	–	National Oceanographic Centre (UK)
FEA	–	Fiji Electricity Authority			
FOSS	–	Free and Open-Source Software			

LIST OF ACRONYMS ... continued

NY	New York		SEAFRAME	Sea Level Fine Resolution Acoustic Measuring Equipment
NZAID	New Zealand Agency for International Development		SERREAD	Scientific Educational Resources and Experience Associated with the Deployment of Argo profiling floats in the South Pacific Ocean
OFDA	Office of US Foreign Disaster Assistance		SOPAC	Secretariat for the Pacific Applied Geoscience Commission
OIP	Ocean and Islands Programme		SPC	Secretariat of the Pacific Community
P-DB	SOPAC Petroleum Databank		SPREP	Secretariat of the Pacific Environment Programme
PEG	Pacific Energy and Gender Network		SPSLCMP	South Pacific Sea Level and Climate Monitoring Project
PEMM	Pacific Energy Ministers' Meeting		SRP	Société de Recherche du Pacifique
PESTRAN	Promotion of Environmentally Sustainable Transportation in the Pacific Islands		STAR	Science, Technology and Resources Network
PIC	Pacific Island Country		SURE	Sustainable Use of Renewable Energy
PICISOC	Pacific Chapter of the Internet Society		TAF	The Asia Foundation
PIEP	Pacific Islands Energy Policy		TAG	Technical Advisory Group
PIEPSAP	Pacific Islands Energy Policy and Strategic Action Planning Project		UK	United Kingdom
PIESAP	Pacific Islands Energy Strategic Action Plan		UNCED	United Nations Conference on Environment and Development
PIESD	Pacific Islands Energy for Sustainable Development		UNDP	United Nations Development Programme
PIFS	Pacific Islands Forum Secretariat		UNDOALOS	United Nations Office of Legal Affairs/Division for Ocean Affairs and the Law of the Sea
PIFSA	Pacific Islands Fire Service Association		UNELCO	Vanuatu power utility
PI-GOOS	Pacific Island Global Ocean Observing System		UNEP	United Nations Environment Programme
PIRC	Pacific Internet Resource Centre		UNESCO-IHE	United Nations Educational Scientific and Cultural Organisation – Institute for Water Education
PIRMBIS	Pacific Islands Regional Maritime Boundaries Information System		UNICPOLOS	UN Informal Consultative Process on the Law of the Sea
PIROP	Pacific Islands Regional Ocean Policy		UNOCHA	United Nations Office for the Coordination of Humanitarian Affairs
PIROP-ISA	Pacific Regional Ocean Policy and Framework for Integrated Strategic Action		UNV	United Nations Volunteers
PITA	Pacific Islands Telecommunications Association		USAID	United States Agency for International Development
PMEG	Programme Monitoring and Evaluation Group (of SOPAC)		USP	University of the South Pacific
PNG	Papua New Guinea		WASH	Water Sanitation and Hygiene
PPA	Pacific Power Association		WB	World Bank
PREFACE	Pacific Rural Renewable Energy France-Australia Common Endeavour Project		WHO	World Health Organisation
PRETI	Pacific Renewable Energy Training Initiative		WMO	World Meteorological Organisation
PV	Photo Voltaic		WSP	Water Safety Plan
PWA	Pacific Water Association		WSSD	World Summit on Sustainable Development
RAF	Resource Allocation Framework		WVLC	Water Virtual Learning Centre
REM	Regional Energy Officials' Meeting		WWF	World Water Forum
REP-PoR	Regional Energy Programme for Poverty Reduction			
ROC	Republic of China (Taiwan)			
RS	Remote Sensing			
RTK	Real-Time Kinematic			

