

SOPAC NEWS

SPC Applied Geoscience and Technology Division (SOPAC)



INSIDE

PALAU DEEPLY APPRECIATES COMPLETION OF EU-FUNDED NATIONAL EMERGENCY OPERATIONS CENTRE

OCEAN AND ISLANDS PROGRAMME COMPLETES CRITICAL SURVEY IN THE STATE OF YAP, FSM

PACIFIC GIS UNITS EMPOWERED WITH FREE AND OPEN SOURCE SOFTWARE

EU-FUNDED C-ENVELOP PROJECT AID IN THE TUAMOTU SURVEY

AUSTRALIAN-FUNDED SEA LEVEL MONITORING PROJECTS AIDS MARITIME BOUNDARY DELINEATION

DIFFERENT RESPONSES REQUIRED FOR DIFFERENT SEABED MINERALS OPERATIONS
SPC SOPAC TAKES WORLD WATER DAY 2012 TO THE WEST FIJI

MAPPING FIJI'S FOREST COVER WITH THE HELP OF SATELLITE IMAGERY

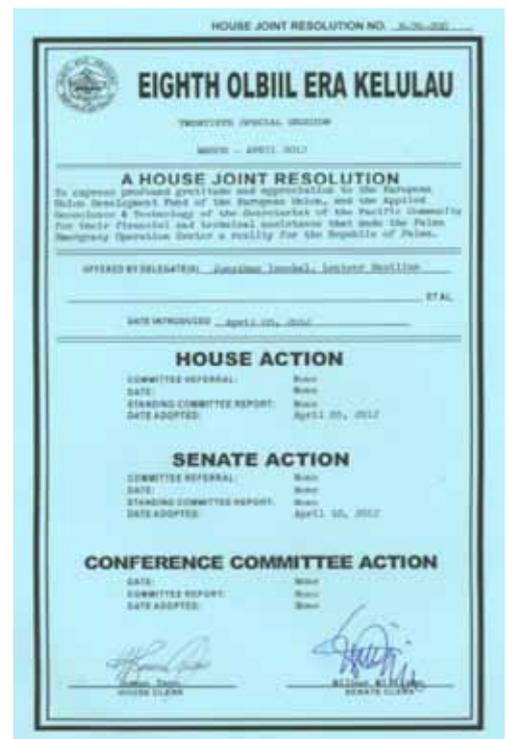
PACIFIC SEA LEVEL & CLIMATE MONITORING PROJECT (SPSLCMP) DATA HELP PACIFIC ISLAND COUNTRIES DEVELOP THEIR MARITIME BOUNDARIES

FEDERATED STATES OF MICRONESIA BRIEFING

PALAU DEEPLY APPRECIATES COMPLETION OF EU-FUNDED NATIONAL EMERGENCY OPERATIONS CENTRE

The State of Palau, at the highest level, expressed “profound gratitude and appreciation to the European Union ... and the Applied Geoscience and Technology (SOPAC) of the Secretariat of the Pacific Community” for its new national Emergency Operations Centre (EOC) facility completed in the first quarter of 2012. The Government of Palau recently sent to Director General Jimmie Rodgers, and copy of Joint Resolution 8-76-20S adopted 10 April 2012, by the 8th Palau National Congress expressing the sentiments. President Toribiong opened the Emergency Operations Centre in early March, with SOPAC Division Director, Russell Howorth, joining him in unveiling the plaque.

The construction costing of about US\$480,000.00 was funded by the European Union through the Disaster Risk Reduction (DRP) B-Envelope Project implemented by the SOPAC Division of the Secretariat of the Pacific Community.



In welcoming this accolade from Palau, SOPAC's director Russell Howorth mentioned that, "It is at times when emails like this arrive from a Member State ... [] ... that one feels justly proud of working for SOPAC whilst at the same time we appreciate the strong support and confidence we enjoy from our European colleagues".

Russell further added that, "... the real credit for this work goes to Mosese Sikivou (manager of DRP), George Beck (manager of the B-envelop Project) and all the staff including ... colleagues in the SPC North Pacific Office that have contributed and facilitated this project".

The EOC will enhance the capacity of the National Disaster Management Office to provide early warning to the public and coordinate post-disaster operations. The project also equipped the building with appropriate communication equipment to enhance its capabilities to provide early warning advise. Some capacity support will also be provided on the various aspects of disaster management and in particular how to operate an efficient emergency operation centre.

The European Union made available a total of €600,000 to the Government of Palau for disaster management through the B-Envelope Disaster Risk Reduction Project.

OCEAN AND ISLANDS PROGRAMME COMPLETES CRITICAL SURVEY IN THE STATE OF YAP, FSM



Part of the damaged barrier walls (circle) that need rehabilitating with petroleum storage tanks behind.



Donato Roqica and Sekove Motuiwaca at drilling site.

The year 2012 was welcomed with the completion of a critical and equally difficult survey in the State of Yap in the Federated States of Micronesia (FSM).

The FSM Petroleum Corporation, sole supplier of fuel throughout FSM, owns and operates six petroleum storage and distribution terminal facilities. In the State of Yap, the Corporation's Yap Terminal was constructed on reclaimed land and a reef structure in the main harbor in Colonia. Over the years, the protecting seawall has suffered damages from wave action, particularly from typhoon events like 2004 typhoon Sudal event. A particular concern was the likelihood of liquefaction in occurrences of earthquakes.

As requested by the Government of FSM, a team of surveyors led by Robert Smith set out to conduct surveys that would provide invaluable data needed to properly upgrade and rehabilitate the Yap terminal seawall.

The scope of work involved 3 major surveys: (1) geotechnical, (2) topographical survey; and (3) bathymetrical survey. The geotechnical survey served to analyse the foundations of the ground upon which the reconstruction of the walls were to occur whilst the topographical survey was to identify all prominent physical features above and underground, in and around the Yap Terminal. The

bathymetrical survey was completed out to a length of 10m to best define the seabed of the site. These 3 surveys combined to construct an invaluable and informative chart that would enable engineers to design and re-construct the barrier walls.

Some notable challenges faced were the lack of equipment hence equipment had to be shipped in from Fiji; the absence of proper details on existing hydrographic chart; the lack of geotechnical specifications for the task that resulted in relocation of the drilling site which was time consuming. There was also the challenge of keeping the drill locations and angle of the ramp stationary with respect to the tidal flows. And other notable risk was a one-off discovery of an unidentified possible Japanese war device which could have been an explosive whilst drilling; not to mention the high risk of working within and around the vicinity of extremely flammable substances. In spite of these challenges, the survey team successfully completed the task unscathed and within the agreed time.

Opinions expressed in this publication are not necessarily those of the Secretariat of the Pacific Community, neither does the mention of any firm or licensed process imply endorsement by SPC.

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PACIFIC GIS UNITS EMPOWERED WITH FREE AND OPEN SOURCE SOFTWARE

Using the right tool for the right job is a common mantra amongst data specialists, but in the Pacific, access to, and more importantly, knowledge about relevant software tools is not readily available.

In the Geographic Information Systems (GIS) domain, undertaking even basic tasks entails using expensive proprietary software solutions. These software solutions are beyond the budget of many government and academic GIS units in the region, and this has resulted in rampant piracy and illegal use of such software.

Seeing a need for freely available GIS software, which has no licensing restrictions, SOPAC Division of SPC actively advocates the use of, and subsequently, provides relevant training on Free and Open Source (FOSS) Geo-spatial software through the work of its SOPAC Division.

In a recent training trip to Solomon Islands Power Authority, Mr Edwin Liava'a, Utilities GIS Specialist, SOPAC Division, deployed FOSS GIS software on their network and conducted relevant training. The software package he used was specifically built for Pacific Islands GIS Units by SOPAC Division.

This will enable the authority's staff to process and deliver timely GIS outputs, free of dependence on external vendors or licensing constraints.

FOSS users will also be able to freely engage with the large online community built around these tools, and receive software support and assistance without any cost.

Gordon Denty, ICT Manager SIEA, commented that, "I think the trend taken by SOPAC towards free and open source software is indeed the way to go. While taking care of licensing issues, FOSS has always proven to be just as good as (or even better) than their proprietary counterparts. Additionally,

the online support is overwhelming compared to proprietary software. With the reviving of the GIS Solomon Island User group, and with SIEA now taking the lead, I hope that the use of Open Source tools will filter through to other organisations. This will no doubt promote a climate of sharing among our different organisations."

University of South Pacific, School of Earth Science and Environment, also strongly endorses FOSS software for Pacific GIS Sectors. Mr Conway Pene, Senior Lecturer, confirmed that USP is incorporating FOSS in a number of GIS courses, and students are experiencing desktop GIS with a range of FOSS and commercial software.

"FOSS GIS applications have seen important developments in the last few years. These have been particularly significant in the areas of desktop GIS for general mapping, and in the usability of desktop mapping applications by non-IT specialists. This has increased the opportunities for projects and organisations with limited budgets to develop desktop mapping capacity," Mr Pene added.

Mr Liava'a stated that "Considering our scale and constraints on financial resources, it is without a doubt that FOSS is the way to go for Pacific Island Countries. The FOSS community is growing at an exponential rate and the support is vibrant and easily accessible over the world wide web."

SOPAC actively promoted and used open source solutions for over a decade as a means to introduce powerful technology into the Pacific islands countries without the substantial costs involved in deploying commercially licensed and vendor supported software. SOPAC Division continues to drive the use of FOSS in the region, from within the SPC.



GIS FOSS training conducted by SOPAC's GIS specialist, Edwin Liava'a.

EU-FUNDED C-ENVELOP PROJECT AID IN THE TUAMOTU SURVEY

Every fifteen to twenty years, the Tuamotu Archipelago, whose highest point is only a few meters above sea level is affected by an intense tropical cyclone (12m swells and winds of up to 200km/hr) causing several hundreds of deaths. In 1983, the cyclone season saw the formation of 5 major cyclones that caused the destruction of more than 70% of many atolls. Furthermore the 1998 Depression Alan caused 60M Euros worth of damage to the high islands of French Polynesia in which an average of thirty plus people died in two major landslides.

Given this background, regulations and policies were developed since 2001 to allow research that would gather information which would aid better understanding of hazards and develop plans to mitigate the effects of such disasters.

While a number of studies and researches had been completed, good topographic and bathymetric data coverage for some lesser developed areas distant from Tahiti has been lacking preventing an accurate assessment of potential impacts.

Upon a request from the Government of the French Polynesia, a survey team led by Mr Jens Kruger, was dispatched under the Disaster Risk Reduction in Pacific Overseas Countries & Territories 9th European Development Fund – C-Envelop Project. The critical survey of the Tuamotu Archipelago of the French Polynesia, which commenced from July 2011, has the acquired sufficient bathymetric, geomorphologic and oceanographic data to model the wave breaking action of storm surge events.

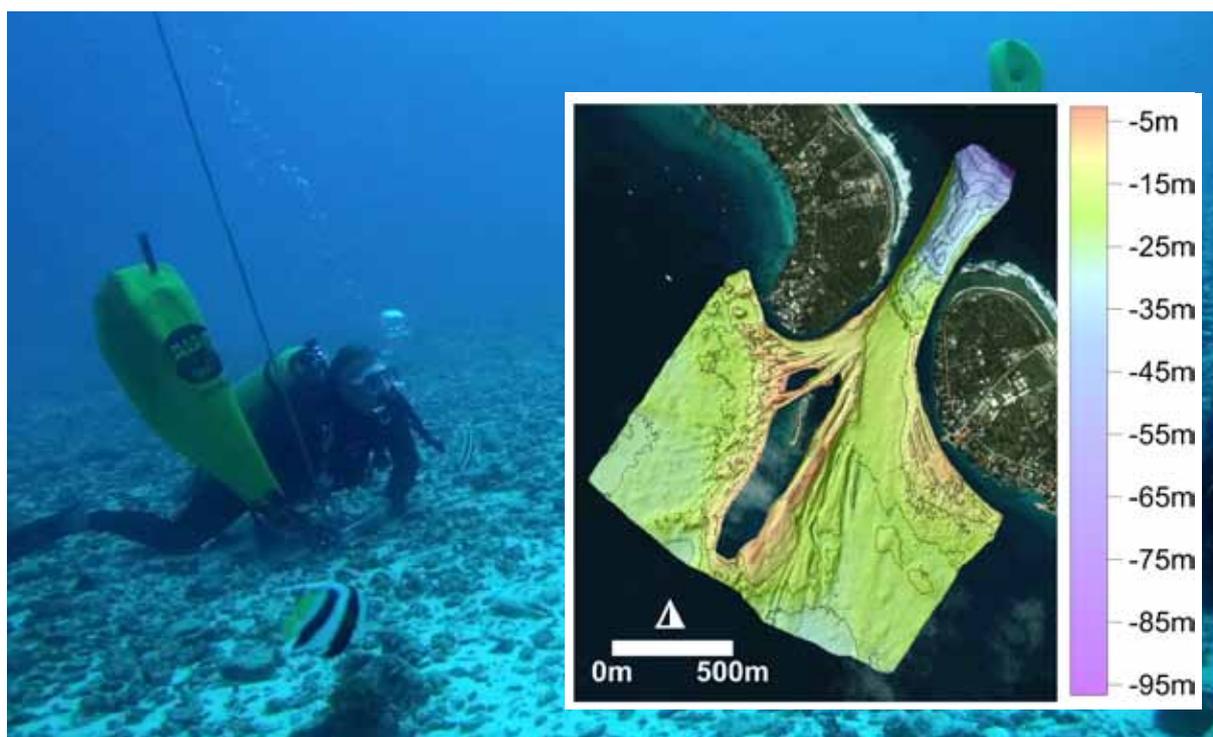


Wave and current meter deployment.

The Tuamotu group is a strategic area for two of the country's economic drivers – tourism and pearl farming. Rangiroa in the Tuamotus, contains 16% of the population of the Tuamotus and is the biggest atoll in the French Polynesia and the second biggest in the world.

This survey would not only enable the refinement of the development regulations to achieve a greater security for people and property, but also produce benefits for tourism, pearl culture and the environment as well as enable the analysis of development potential in French Polynesia.

The data acquisition work on all five atolls of Rangiroa, Arutua, Apataki, Kauehi and Arutua was completed as scheduled. Storm surge modeling and development of maps commenced in January and is currently underway.



Deployment of current profiler. Inset: Bathymetry of Tiputa Channel, Rangiroa.

AUSTRALIAN-FUNDED SEA LEVEL MONITORING PROJECTS AIDS MARITIME BOUNDARY DELINEATION

The data and facilities provided by the South Pacific Sea Level and Climate Monitoring Project (SPSLCMP) is well known for its use in tracking sealevel change and variability over time and is even used to track sealevel changes which occur due to storms and tsunami in the Pacific Islands Region. However, it is not generally known that SPSLCMP data and facilities also provide a critical service and information which supports work by the Ocean & Islands Programme's Maritime Boundary Sector. Given these two work Sectors both lay within the Ocean & Islands Programme, it's easy to overlook the close and complementary interaction but it's a story worth telling.

Maritime Boundaries (often just thought of as EEZs – Exclusive Economic Zones) all have to be very accurately measured from the shores of each Island State or Territory. That shoreline starting point is called a "baseline" and in the Tropical Pacific these usually correspond to a line "drawn" using GIS techniques around the outer reef edges of an island or island group at lowest astronomical tide (LAT). To do this accurately it is obviously necessary to have a high quality sealevel data and precise map reference points, the SPSLCMP provides both of these in 12 locations across the Pacific Island Region.

The SPSLCMP is an Australian Government funded programme of work which spans 12 Pacific Island Countries and has been recording high quality sealevel, temperature, wind and atmospheric pressure data for 20 years. The SPSLCMP gauge on each island is also associated with a CGPS (Continuous Geographic Positioning System) to determine possible vertical movement of the island due to regional tectonic activity. Because the CGPS is extremely precise it can measure changes in position of less than 1 mm in any direction, obviously this is an important consideration when measuring total sea level change on an island. However, the CGPS also provides an excellent "reference point" which can be used to improve



Workshop participants.

the positional accuracy of island maps, charts and even satellite imagery. Many older charts and maps in the Pacific are outdated and inaccurate and they can show the position of islands and sometimes whole island groups to be hundreds of meters and sometime kilometres away from their true position on the surface of the globe. Chart and map positional error is a major problem for Maritime Boundaries development as the lines drawn to measure PIC EEZs and shared boundaries need to be as accurate as possible. This is where the SPSLCMP CGPS facility becomes invaluable to the high precision work of the Maritime Boundaries Sector in determining the correct position of PIC baselines and then the measurement of maritime zones and limits (e.g. territorial seas, contiguous zones and EEZs).

There remains much maritime boundaries work to be completed in PICs however the Ocean & Islands Programme in collaboration with our many technical partners (Geoscience Australia, UNEP Shelf Programme, Commonwealth Secretariat, Forum Fisheries Agency and Australia Attorney General's Department) and using high quality data from the SPSLCMP has earned a name for producing excellent "state of the art" maritime boundary solutions which are on a par with work anywhere in the world.



Workshop participants.

DIFFERENT RESPONSES REQUIRED FOR DIFFERENT SEABED MINERALS OPERATIONS

Concerns about protecting the environment during exploration and mining for deep seabed minerals will not be addressed by a 'one size fits all' solution.

Dr Malcolm Clark, Principal Scientist (Deepwater Fisheries) at the National Institute of Water and Atmospheric Research (NIWA) Wellington, New Zealand, expressed this opinion during the international workshop on Environmental Management Needs for Exploration and Exploitation of Deep Seabed Minerals.

The workshop, jointly organised by SOPAC a division of the Secretariat of the Pacific Community and the International Seabed Authority, took place in Nadi, Fiji, during December 2011, as a part of the European Union funded, four-year Deep Seabed Minerals Project.

Dr Clark said that the more we learn about the deep sea the more we realise that parts of it are split up into smaller environmental packages, and we don't have a good understanding of how large these package-like "ecosystems" are, or the degree of connectivity between them.

There are three types of deep seabed deposits that are being considered as potential resources to be mined: massive sulfide deposits cobalt crusts, and manganese nodules.

"Although it is out of sight, the deep sea has complex topography just like on land, and there are different deep-sea environments that have different fauna (animals) and different mineral deposits. These differences in the structure and content of the sea floor would call for different exploration and mining techniques. These mining operations, in turn, would have a correspondingly different effect on the surrounding fauna, and require different management responses," explained Dr Clark.

"Although our knowledge is still incomplete, we are rapidly learning about the ecosystems and effects of human activities on them, and can be positive for a future in which a balance can be achieved between mining and conservation."

The massive sulfide deposits have formed around hydrothermal vents that typically are found in areas where there is movement of the earth's tectonic plates, such as along the mid-ocean ridges, which are underwater mountain chains that weave around the earth where mid-ocean ridge spreading occurs, and in back-arc areas in the western South Pacific where the seafloor is being "consumed".

Hydrothermal vents are commonly associated with underwater volcanic activity. Deep below the seafloor, through openings in the earth's crust, sea water interacts with the molten magma layer under the earth's crust, and spews back in a super

heated form, bringing with it minerals in solution that become solid particles as they come into contact with the near freezing sea water. Over thousands of years, massive sulfide deposits have formed, containing gold, silver, copper, zinc, lead, and other trace elements.

The hydrothermal system also brings energy-rich, reduced chemicals that are used by bacteria that form the base of the food web for the fauna living in the depths around vents.

"These hydrothermal vent communities are adapted to the particular chemical and temperature conditions of that particular venting system. These chemosynthetic communities do not rely on sunlight, but utilize the hydrogen sulphide in the water-this is toxic to most life forms, but animals in the vent areas have adapted and evolved for those specific conditions and have quite high levels of unique species," explained Dr Clark.

"If that vent turns off, which happens naturally, or if the volcanic activity moves, is mined out, or in some way disrupted during mining, the more specialized animals will die out unless they can find exactly the same conditions in a nearby vent field. "This is why the protection of a similar area close to the mined one is important so that the same communities as at the mined site are able to survive."

Cobalt crusts exist on the sides and tops of mountains under the sea. The creatures that live here are adapted to the rocky seamount environment, which is kept sediment free by the swirling currents, common around seamounts.

With mining the cobalt crust, there could be devastation to much of the upper region of the seamount, as the crust needs to be stripped off over large areas. Dr Clark explained, because of the oceanographic currents around seamounts, the sediment created during mining could also cover a large area, and would be harmful to the fauna that are adapted to living on rocky surfaces, smothering small animals, and clogging the feeding mechanisms of filter-feeders which are common on seamounts (such as corals and sponges).

"We would have to find another seamount with similar communities to be a protected area, far enough away to not be affected. This is a spatial scale of tens of kilometres, compared with just kilometres when dealing with hydrothermal vent communities," said Dr Clark.

The third kind of mineral deposit, in which there is interest in mining, are manganese nodules. These are found at depths of 4,000 to 5,000 metres on the abyssal plains, the flat areas beneath the sea that cover nearly 50% of the earth's surface. The



growth of manganese nodules is one of the slowest geological processes, at the rate of a centimeter over several million years.

“The abyssal plains occur for hundreds to thousands of kilometres, so their geographical extent is huge,” said Dr Clark. Mining of the nodules, which occur on the surface of the seafloor as well as partially buried in the sediment, may extend for a large area, much larger again than on cobalt-rich seamounts.

Life in these depths is not as obvious as on the shallower seamounts. The almost microscopic animals living on the nodules, called Foraminifera,

are almost microscopic, while the dominant animals in these areas are types of worm (nematodes and polychaetes) found living under the surface, in the sediment, raising the question as to how large an area would be needed to provide these creatures with an alternative, protected marine environment.

“The spatial scales, and the time things take to happen, vary between the three types of mining situation. The distinctly different environments with their own faunal communities, and different mining operations, will require different management responses for each,” said Dr Clark.

SPC SOPAC TAKES WORLD WATER DAY 2012 TO THE WEST FIJI

World Water Day is celebrated on the 22nd of March every year. In this event, the United Nations releases a global water-related theme; this year being Water and Food Security; looking at linkages between water and food production. The responsible UN agency for WWD this year is the Food and Agriculture Organisation (FAO). As in the past a Pacific theme is coined from the global theme and the Pacific theme this year is “Water Security is Food Security” - basically if we secure water resources we secure our food resources because much of the water is used in food production.

Every year SOPAC is responsible for World Water Day celebration in the region and the Division supported the countries in celebrating WWD by providing them with awareness materials such as posters, stickers and bags that were used for the celebrations. Since the theme is on food security, SOPAC approached the Department of Agriculture to partner in organising the Fiji national event 2012. The campaign was endorsed and vetted by the Commissioner Western Office together with the Nadi Basin Catchment Committee and relevant government agencies.

The Land, Water and Resource Management Division of the Department of Agriculture helped organise the event using the IWRM GEF funded Nadi Basin Catchment Project as a vehicle to drive the event in the Western Division. For the first time in Fiji there was a World Water week celebration starting from Rakiraki all the way to Sigatoka. The week long campaign, was launched at Penang High School in Rakiraki. About 10 schools joined in the celebration of WWD respectively; beginning from Penang High School and ending at Sigatoka Methodist College where invitations were sent out to respective nearby schools. Part of the programme was the setting up of displays by SOPAC Division and various government departments. The road



Students at the WWD Western Vitilevu, Fiji.

show team included officials from the Department of Lands, Department of Forestry, Ministry of Health, Ministry of Education through the National Library Services, Department of Environment, Fiji Meteorology Department, Water Authority of Fiji, SPC-SOPAC Division and the Ministry of Information who covered the story throughout the week.

The major celebration on the 22nd of March was held at the Prince Charles Park in Nadi and was launched by the Honourable Minister for Primary Industry Mr Jocketani Cokanasiga. Invited guests included government officials and relevant agencies such as the Nadi Basin Catchment Committee. Schools around the Nadi area were also invited to the event and there were quizzes and spot prizes including a successful oratory competition for the high school students.

The road show ended on Friday 23rd March with a double celebration of World Water Day and World Meteorological Day at Sigatoka Methodist College.



MAPPING FIJI'S FOREST COVER WITH THE HELP OF SATELLITE IMAGERY

The Secretariat of the Pacific Community (SPC) has embarked on a programme to build capacity in mapping land/forest cover in Fiji using very high resolution satellite images. The programme has three phases consisting of both theory and practical work, including 'ground truthing' (on-site verification of data from satellite imagery) exercises to be held later this month.

The training, which is jointly organised by SPC's Land Resources Division (LRD) and its Applied Geoscience and Technology (SOPAC) Division, involves participants from the Fiji Department of Forestry and SPC.

The ground truthing exercise will be undertaken in Drawa – a model area for sustainable natural resource management located in Vanua Levu that covers about 6,400 hectares of indigenous forest.

The first phase of the training exercise focuses on enhancing and analysing satellite images of Drawa forest where SOPAC removes atmospheric disturbances and increases the resolution of visual and near infrared image information. These enhanced images are then used to classify the forest cover into different forest types to conduct forest inventory for the estimation of forest carbon stock per unit area of each forest type.

The second phase of the training will include establishing monitoring plots with wood and carbon stock assessment, while the third phase will focus on carrying out a biodiversity survey.

SPC Regional Community Forester Jalesi Mateboto explained that two projects currently support the work in Drawa: Live & Learn, a non-governmental

organisation (NGO) that is conducting community-based activities related to REDD+ (Reducing Emissions from Deforestation and Forest Degradation) in the area with financial support from the European Union; and the Land Owners Association of Drawa, which is implementing the Drawa Forest Biodiversity Conservation Project with a grant from the Global Environment Fund (GEF) and the United Nations Development Program (UNDP).

SPC's LRD is joining the work in response to requests from these projects for technical support.

Mr Mateboto also said that the objectives of SPC's involvement in Drawa are to build the capacity of community groups, NGOs and the relevant government agencies in the area of forest monitoring and forest carbon assessment; to provide accurate forest carbon data to assist the community-based activities related to REDD+ in Drawa; and to test and improve the monitoring, assessment and reporting manual for sustainable forest management in Pacific Island countries. It is hoped that these activities will also contribute to the establishment of Fiji's national Measurement, Reporting and Verification system, strengthening the country's REDD+ programme.

The Japan International Cooperation Agency (JICA) and the German development cooperation agency Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) are supporting this exercise, which also responds to some of the forestry priorities specified in the SPC/Fiji Joint Country Strategy.



Satellite image of Fiji's forest cover. Inset: Fiji's forest cover mapping trainee.

PACIFIC SEA LEVEL & CLIMATE MONITORING PROJECT (SPSLCMP) DATA HELP PACIFIC ISLAND COUNTRIES DEVELOP THEIR MARITIME BOUNDARIES

Pacific Sea Level & Climate Monitoring Project (SPSLCMP) Data Help Pacific Island Countries Develop Their Maritime Boundaries

The data and facilities provided by the South Pacific Sea Level and Climate Monitoring Project (SPSLCMP) is well known for its use in tracking sealevel change and variability over time and is even used to track sealevel changes which occur due to storms and tsunamis in the Pacific Islands Region. However, it is not generally known that SPSLCMP data and facilities also provide a critical service and information which supports work by the Ocean & Islands Programme's Maritime Boundary Sector. Given these two work Sectors both lay within the Ocean & Islands Programme, it's easy to overlook the close and complementary interaction but it's a story worth telling. Maritime Boundaries (often just thought of as EEZs – Exclusive Economic Zones) have to be very accurately measured from the shores of each Island State or Territory. That shoreline starting point is called a "baseline" and in the Tropical Pacific these usually correspond to a line "drawn" using GIS techniques around the outer reef edges of an island or island group at Lowest Astronomical Tide (LAT). To do this accurately it is obviously necessary to have high quality sealevel data and precise map reference points, the SPSLCMP provides both of these in 12 locations across the Pacific Island Region.

The SPSLCMP is an Australian Government funded programme of work which is managed by the Australian Bureau of Meteorology and spans 12 Pacific Island Countries (PICs). The SPSLCMP has been recording high quality sealevel, temperature, wind and atmospheric pressure data for 20 years. The SPSLCMP gauge on each island is also associated with a CGPS (Continuous Global

Positioning System) to determine possible vertical movement of the island due to regional tectonic activity. Because the CGPS analysis is extremely precise it can measure changes in position in the order of 1mm in any direction over time. Obviously this is an important consideration when measuring total sea level change on an island. However, the CGPS also provides an excellent "reference point" which can be used to improve the positional accuracy of island maps, charts and even satellite imagery. Many older charts and maps in the Pacific are outdated and inaccurate and they can show the position of islands and sometimes whole island groups to be hundreds of meters and sometime kilometres away from their true position on the surface of the globe. Chart and map positional error is a major problem for Maritime Boundaries development as the lines drawn to measure PIC EEZs and shared boundaries need to be as accurate as possible. This is where the SPSLCMP CGPS facility becomes invaluable to the high precision work of the Maritime Boundaries Sector in determining the correct position of PIC baselines and then the measurement of maritime zones and limits (e.g. territorial seas, contiguous zones and EEZs).

There remains much maritime boundaries work to be completed in PICs however the Ocean & Islands Programme in collaboration with our many technical partners (Geoscience Australia, UNEP Shelf Programme, Commonwealth Secretariat, Forum Fisheries Agency and Australia Attorney General's Department) and using high quality data from the SPSLCMP has earned a name for producing excellent "state of the art" maritime boundary solutions which are on a par with work anywhere in the world.



Andrick Lal - CGPS Station, Cook Islands.

FEDERATED STATES OF MICRONESIA BRIEFING

Federated States of Micronesia Ambassador to Fiji, HE Gerson Alik Jackson was briefed at the Suva headquarters of the Applied Geoscience and Technology Division (SOPAC) of the Secretariat of the Pacific Community (SPC) on Friday 9th March. This visit was a follow-up to a meeting with the SOPAC Director, Dr Russell Howorth and the Manager of the SPC North Pacific Regional Office, Mr Amena Yauvoli. The senior technical advisers at the SPC/SOPAC Division office who are working with the FSM briefed the Ambassador on five important areas of SOPAC work currently underway for the FSM. These included determination of FSM's maritime boundaries, exclusive economic zone (EEZ), and related extended continental shelf claim; refurbishing of the emergency operation centres in the four states and the commencement

of the construction of the first national emergency operation centre in Palikir together with the purchase of new emergency communications equipment and related training; the work with the FSM Petro Corp to reduce the risk of storm damage at the Yap and Chuuk oil storage depots, and an integrated ridge to reef water resources management project focusing on Nett Municipality in Pohnpei.

Ambassador Jackson expressed his appreciation for the briefing on the work underway for the FSM, and emphasized the important contribution of the SOPAC Division in supporting these areas of development in the FSM. SOPAC Division has also responded positively to a request from the Ambassador for assistance with the setting up of a website for the FSM Embassy in Suva.



Ambassador Jackson together with the SPC/SOPAC Division Director Dr Russell Howorth and Senior Technical Advisers.

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