In extractive industries, data and information management is crucially important for advanced development (i.e. scientific and engineering) planning. Given the geographical location of Pacific Island communities, Geographical Information Systems (GIS) and Remote Sensing (RS) can make things easier, cost effective, and saves time in the development of intervention plans. GIS is particularly important in marine management including the development and management of deep sea mineral resources. The SPC-EU Deep Sea Minerals (DSM) Project is dedicated to building capacity around DSM, and GIS training is one of the streams that are supported.

Vanuatu
Vanuatu requested assistance from the DSM Project in the proper management of the Vanuatu Minerals Resource Database; to ensure it is up-to-date, and that the DSM data is held in an orderly and safe manner.

In response to this request, the DSM Project sent two trainers from SPC to run two two-week training sessions in Vanuatu during February and March 2014. The first session addressed data management using Visual Basic and SQL programmes and methodologies. The second session addressed GIS and tools available to graphically display the data held in Vanuatu’s databases, and the incorporation of GIS as a management tool.

Fifteen participants from different government agencies (Lands Department, Department of Geology and Mines, Department of Forestry, Office of the Government, Chief Information Officer, and Office of the Valuer General) took part in the training.

The DSM Project will also provide the Vanuatu Mineral section with a desktop computer and laptop to enable consistent ongoing minerals data management including DSM.

The participants expressed sincere appreciation to the SPC and SPC-EU DSM Project for both of the trainings with positive feedbacks on the content delivered.

Solomon Islands
The Ministry of Mines, Energy and Rural Electrification (MMERE) in the Solomon Islands recently undertook institutional assessments. This identified a need for improved data management skills, in order to promote more efficiently the terrestrial and marine minerals potential within the Solomon Islands, as well as to manage and monitor existing mineral activities.

Solomon Islands participants in Honiara during the first phase of training.
The DSM Project and the GIS & RS section of the SPC (SOPAC Division) provided financial and technical assistance to the MMERE through an especially designed training programme. The programme consisted of two sessions; one at the SPC offices in Suva and one held in the Solomon Islands. Mr Bryan Pitakia, a local GIS expert in Solomon Islands, was funded to train a number of officers at the MMERE on geological data analysis and interpretation using relevant GIS and RS techniques.

Mr Joseph Ishmael, Deputy Director Mines; Mr Eddie Akako, Senior Tenement Officer at the Mines Division; and Mr Carlos Tatapu, Senior Information Officer at the Geology Division attended the first 4-week training session at the SPC offices in Suva in November 2013.

The second session held between January and February 2014 in Honiara was to complete the first phase of GIS training for Solomon Islands. This training was attended by 11 staff from the Water Resources Division, Geology Division and Mines Division and included participants from the Suva session. The 2nd phase of training in ‘Advanced GIS’ is expected to commence in July.

Geological training

Kiribati has a vast Exclusive Economic Zone (EEZ) of more than 3.5 million square kilometres, with confirmed potential of manganese nodule deposits. To build capacity in Kiribati the DSM Project sponsored Ms Tokabai Bauro, an Environment Research Officer, from the Ministry of Fisheries and Marine Resources Development to undertake a month-long training placement with the United States Geological Survey in February 2014, to develop skills in geological analysis of manganese nodules, data analysis and interpretation as well as report writing.

Working with Dr Jim Hein’s team, Tokabai performed mineralogy analyses on nodule samples from the Pacific Clarion Clipperton Fracture Zone (CCFZ) area of seabed, located to the East of Kiribati’s Line Islands EEZ.

Kiribati also has a State Enterprise, Marawa Research and Exploration Limited, which successfully applied in 2012 for a contract with the ISA, under which it will explore for manganese nodules in the CCFZ. The skills Tokabai gained from her experience at USGS will be applicable in both Kiribati’s own nodules in their EEZ as well as in exploration of CCFZ.

KIGAM and KIOST looking to the Pacific

As part of the SPC SOPAC Division’s effort to rekindle collaboration in mineral and marine research with new and existing partners, Prof Michael Petterson, Director of the SOPAC Division and Mr Akuila Tawake, Deep Sea Minerals Project Team Leader, visited two renowned Korean research institutions: the Korean Institute of Geoscience and Mineral Resources (KIGAM), and the Korean Institute of Ocean Science and Technology (KIOST) in early March 2014. Both institutions expressed their willingness to work with SPC and increase of their work programmes in the Pacific region.

KIGAM has significant expertise in geoscience with an international training school in Daejeon City, Korea, that includes a short-course on submarine geology. The DSM Project is looking forward to utilising this new collaboration to offer training opportunities for Pacific islanders.

KIOST has a marine research centre in Chuuk, FSM, and are looking at attaching an officer to the SOPAC Division. The Government of Korea in collaboration with the Korea scientific research institutions are organising an August 2014 meeting for small island states and one of the themes is to explore ways in which research organisations such as KIOST can assist the Pacific region.
February and March were busy months for the DSM Project with staff members attending 4 international meetings on deep sea mineral issues. The current status of DSM work and developments in the region were highlighted at the meetings, and discussions were held to explore potential for collaboration by Pacific Islands with other international DSM initiatives.

DSM Project Team Leader, Akuila Tawake and SOPAC Director Professor Michael Petterson attended The E-tech Element Potential of Submarine Ferromanganese Crusts: Research Challenges Workshop (27th–28th February 2014, in London). This standalone workshop, coordinated by the National Oceanographic Centre, UK and the British Geological Survey, brought together a multi-disciplinary audience of geological, biological and oceanographic researchers and industry specialists with the aim of identifying key knowledge gaps and science opportunities related to ferromanganese crusts.

The findings of the workshop and the network developed during the workshop will form the foundation of a consortium Research Grant Application. The organisers of the workshop are keen to include the Pacific and SPC in this £3m research programme for ferromanganese crusts and electronic/green metals. If the application is successful, SPC will potentially be involved as one of the implementing partners.

DSM Project Legal Advisor Hannah Lily attended and presented on developments in the Pacific region at the Deep Sea Mining Summit (18th–19th March 2014) in London which is an annual event in its second year, organized by a private events company, and designed to showcase global DSM developments to an audience including prospective investors. Information about the programme is available here: http://deepsea-mining-summit.com/

Hannah Lily represented the DSM Project, and the Pacific region, at the MIDAS (Managing Impacts of Deep Sea Resource Exploitation) ‘EIA Indicators’ Workshop (20th–22nd March 2014, London). MIDAS is a newly-launched 3-year €12m EU-funded project, bringing together 32 institutions across Europe, in 10 work packages, designed to produce research and recommendations to assist key stakeholders measure and manage the impacts of deep-sea mining. This workshop brought together marine biologists, ecologists, geologists, oceanographers, EIA practitioners, and law and policy specialists to discuss key indicators for environmental impact assessment processes ‘in the real world’. More information about MIDAS is available here: http://eu-midas.net/

Hannah Lily attended the DOSI (Deep Ocean Stewardship Initiative) ‘Defining Significance’ workshop (26th–28th March 2014, San Diego). DOSI is an international network of professionals concerned to maintain the integrity of deep-ocean ecosystems. DOSI does not have independent funding, but draws on the commitment of an impressive group of world-leading experts in relevant science, law, economics and regulatory practice. This workshop, funded by INDEEP and hosted by Scripps Institute in the United States, considered how to define ‘significant impacts’ in relation to deep sea mineral activities. Joseph Brider of the Cook Islands National Environment Service also attended the meeting, and Hannah and Joseph will co-author a ‘What does this mean for policy-makers?’ section of a paper to be produced later this year by the meeting attendees. More information about DOSI, is available here: http://www.indeep-project.org/deep-ocean-stewardship-initiative
THE PROSPECT

Participants at the DOSI workshop, USA.

Akuila and Hannah sought, with their engagement in the meetings, to encourage international DSM researchers to direct their work and resources into relevant and meaningful areas for the Pacific, highlighting that it is the under-resourced Pacific Island Governments who will be at the front-line, taking permitting decisions, and monitoring and regulating DSM mining when it takes place, and asking that international efforts provide tools that will enable best-practice regulation by Pacific Island Governments (as well as the ISA).

Akuila and Hannah were delighted during their meetings to make connections with other States outside of the Pacific region undergoing similar deep-sea management through processes as well as with global experts working in the DSM field. DSM Project will be exploring new opportunities for Pacific Islands involvement in future initiatives, building on the contacts made during these meetings. So watch this space…

An opportunity for Pacific Islands to comment on international seabed minerals regime

The International Seabed Authority (ISA) released a stakeholder survey in March.

This is the first time the ISA has sought stakeholder input in this way. The results of the survey will influence extremely important future ISA regulations, including (i) the rules for mining the seabed beyond national jurisdiction (‘the Area’) and (ii) how any proceeds from that mining will be shared for the ‘Common Heritage of Mankind’.

These are matters of high relevance and interest to all developing States, and also to Governments interested to hold or sponsor contracts in the Area. Once the ISA’s rules are finalised, national Governments will be required to match those rules in their national laws for seabed minerals within their EEZs.

It is therefore very important for Pacific Island countries to participate in this survey, to ensure that the voices of developing Pacific nations are heard. As well as submitting its own response, the DSM Project encouraged its member countries to participate, and to send a response to the ISA.

Responses to the survey can be found at:
Internship Programme

As part of our capacity-building initiative, the DSM Project established a successful Internship Programme. To-date, this programme has focused on legal aspects of DSM where participants have received first-hand experience of the international law framework governing the deep sea minerals sector. The programme has recently expanded to also include geology, geographical information system (GIS) and general project internships.

More information about the internship scheme, and the previous participants is on the website: http://www.sopac.org/dsm/index.php/internship-program

Legal Intern

Mr Teona Ivano – Papua New Guinea

Teona, an undergraduate law student from the University of PNG, was the 11th and most recent law student to intern with the DSM Project (21st January to 14th March 2014). Teona was assigned research tasks such as reviewing UNCLOS and the 1994 Agreement to analyse its treatment of developing states. With the experience gained from his internship at the DSM Project, Teona plans to write his Major Research Paper on Deep Sea Mineral Mining and Law.

“I want to thank the DSM Project Legal Team for the opportunity to learn at the Project. I have much to contribute to my nation and this internship programme is an invaluable experience, an impetus to drive me forward to accomplish more”, he said.

GIS Intern

Mr Marino Wichman – Cook Islands

Marino graduated with a Bachelor of Applied Science majoring in GIS and Physical Geography from the University of Otago, New Zealand. He is the third GIS intern to the DSM Project. Marino will soon be employed by the Cook Islands Seabed Minerals Authority (SBMA) and the purpose of his internship was to build the GIS capacity of the SBMA. During his 3-month internship in Suva, from 10th February to 2nd May 2014, Marino worked closely with geo-spatial professionals and assessed storage, manipulation, management and analysis protocols of spatial data. He was able to generate geological models of Cook Islands manganese nodule metal contents and abundance based on previous survey data during this attachment.

Working with different software packages gave Marino insight into understanding and evaluating geo-spatial tools and their different applications.

Marino aspires to bring home geo-spatial innovation to the Cook Islands, contributing to the development of the nation as a whole.

“I am extremely lucky and humbled to work alongside the elite geo-spatial professionals of the Pacific region. The DSM Project internship has provided me with additional knowledge and skills which are in high demand in the Cook Islands,” he said.

Geology Intern

Mr James Davies – England

James, a British geology graduate from the University of Leicester (UK), was the second geology intern to the DSM Project. During his internship, from 27th January to 9th May 2014, he collated existing seabed minerals data for Fiji, Republic of the Marshall Islands and Kiribati, into a format that can be used in a cost-benefit analysis of deep sea mining activities in the region. He reviewed draft country-specific information brochures on the seabed mineral resources of Papua New Guinea, Solomon Islands, Vanuatu, Niue and Palau.

As part of his placement, James spent 4 weeks in the Cook Islands working on manganese nodule research with the Cook Islands Seabed Minerals Authority, where he produced a report on the profile of sea-floor sediments and a sensitivity analysis of the SBMA’s seabed minerals economic model.

James has his sights set on further studies, and hopes to apply the skills gained during his time at the DSM Project towards a seabed minerals-based Master’s thesis.

Institution Internship Number of Participants to Date
Legal Internships 11
ISA Legal Internships 2
Legal Government Attachments 6
Geology Internships 2
GIS Internships 3
Project Internships 1

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Upcoming Events

Rhodes Academy of Oceans Law and Policy, Greece
The Rhodes Academy is a prestigious 3-week international summer school from the 29th June, 2014 to the 18th July 2014. The basic objective of the Rhodes Academy is to promote the rule of law in the ocean, and provide a forum for scholarly discussion on the principles of the ocean law and policy. Participants will be taught by world experts, and will broaden their understanding of and importance of implementing the rule of law set out in international agreements and national state practice. Alex Herman, Senior Legal Advisor to the Cook Islands Seabed Minerals Authority, who attended the Rhodes Academy last year, with DSM Project funding, described the opportunity as a “once-in-a-lifetime” experience. Please visit http://www.virginia.edu/colp/rhodes-academy.html for further information.

International Foundation on the Law of the Sea (IFLOS), Germany
The IFLOS is founded by the International Tribunal on the Law of the Sea, and will run a Law of the Sea training course, delivered by Tribunal judges, from the 27th of July to the 22nd of August 2014, with particular focus on the peaceful settlement of law of the sea disputes and further implementation of the UNCLOS. IFLOS is keen to promote learning and research in the field of international law of the sea at a global level, in particular, nationals of developing countries. Please visit http://www.iflos.org/en/home.aspx for further information.

Duke University Marine Conservation Summer Institute, USA
Duke University Marine Laboratory’s summer institute on marine conservation is a practicum in natural science, social science, law, and policy for professionals, graduate students, and advanced undergraduates. It immerses students in the world of marine conservation biology and policy, giving them a set of basic tools for addressing and understanding issues of conserving marine biodiversity. The institute will run from 7th July to 8th August and this year’s themes are: Human Dimensions and the Marine Environment; Deep-Sea Conservation & International Ocean Governance; Invasive Species; Marine Vertebrate Conservation; and US Oceans Law. A government official from Tonga has been sponsored by the DSM Project to attend this training opportunity. This training will be offered again in 2015.

Underwater Mining Institute Conference, Portugal
The Underwater Mining Institute (UMI) brings together leaders from academia, industry, and government who share a common interest in marine mining and exploration. Held in Portugal from the 21st to 28th September, the 2014 theme of the UMI conference is ‘Harvesting Seabed Mineral Resources in Harmony with Nature’. The DSM Project will be sponsoring three government officials to attend this conference.
## Overview of DSM activities in the DSM Project’s member countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Mineral Potential</th>
<th>Exploration Licences Issued</th>
<th>Mining Licence Issued</th>
<th>Sponsoring State in ‘the Area’</th>
<th>Law and Policy Development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiji</td>
<td>SMS</td>
<td>√</td>
<td></td>
<td>Interest shown</td>
<td>Decree for State sponsorship in ‘the Area’ enacted 2013. Review of Minerals Act, and new law (including DSM) planned.</td>
</tr>
<tr>
<td>FSM</td>
<td>Crusts (SMS?)</td>
<td>Interest shown</td>
<td></td>
<td></td>
<td>Draft DSM Bill with Congress.</td>
</tr>
<tr>
<td>Kiribati</td>
<td>Nodules, Crusts</td>
<td>√</td>
<td></td>
<td></td>
<td>DSM Policy under consultation.</td>
</tr>
<tr>
<td>Nauru</td>
<td>Unknown</td>
<td>√</td>
<td></td>
<td></td>
<td>Draft law for State sponsorship in the Area with Ministry of Justice, and law officers placement with DSM Project scheduled for August 2014.</td>
</tr>
<tr>
<td>Niue</td>
<td>Nodules, Crusts</td>
<td></td>
<td></td>
<td></td>
<td>Draft DSM Bill and licensing Regulations with Crown Law.</td>
</tr>
<tr>
<td>Palau</td>
<td>Unknown (SMS?)</td>
<td></td>
<td></td>
<td></td>
<td>Palau is considering a policy of declaring the EEZ a protected area. Offshore petroleum law in place.</td>
</tr>
<tr>
<td>PNG</td>
<td>SMS</td>
<td>√</td>
<td>√</td>
<td></td>
<td>Review of existing mineral law and finalisation of national DSM policy planned.</td>
</tr>
<tr>
<td>RMI</td>
<td>Crusts</td>
<td></td>
<td></td>
<td></td>
<td>Draft DSM Bill and licensing Regulations with Attorney General’s Office.</td>
</tr>
<tr>
<td>Samoa</td>
<td>Crusts</td>
<td></td>
<td></td>
<td>Interest shown</td>
<td>Samoa has a ‘watch and wait’ policy for DSM currently.</td>
</tr>
<tr>
<td>Solomon Islands</td>
<td>SMS</td>
<td>√</td>
<td>Application received</td>
<td></td>
<td>Review of Mining Act, and drafting of new Policy and Bill, to incorporate DSM planned.</td>
</tr>
<tr>
<td>Timor-Leste</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Comprehensive offshore oil and gas regime.</td>
</tr>
<tr>
<td>Tonga</td>
<td>SMS</td>
<td>√</td>
<td>√</td>
<td></td>
<td>Draft DSM Bill and Regulations with Attorney General’s Office.</td>
</tr>
<tr>
<td>Tuvalu</td>
<td>Nodules, Crusts</td>
<td>Interest shown</td>
<td></td>
<td></td>
<td>DSM Bill and Regulations with Attorney General’s Office, and due to go before Parliament in July 2014.</td>
</tr>
<tr>
<td>Vanuatu</td>
<td>SMS</td>
<td>√</td>
<td></td>
<td></td>
<td>Policy consultation underway now, in all Provinces. Relevant law to be drafted subsequently.</td>
</tr>
</tbody>
</table>
**Profile**

Christine Prasad, Junior Geologist for the SPC-EU Deep Sea Minerals Project

Christine, a recent Geology graduate from the University of Otago, NZ has joined the DSM Team as Junior Geologist. Christine was a Project Intern at the DSM Project for 6 months prior to her new permanent appointment. Christine will be working on with the DSM Project as well as with the SPC’s Environmentally Safe Aggregate for Tarawa (ESAT) Program.

**Q:** What do you hope to achieve in your new role?

A: I wish to provide my best service to the Pacific Island nation on how to plan, develop, and manage their natural resources, which in turn would improve their livelihood. Additionally being a young graduate, it will be a great learning experience for me working with a talented and experienced team.

**Q:** What do you like most about your new job?

A: This job gives me an opportunity to meet people in this industry and learn about additional aspects of deep sea minerals such as policy and environment.

**Q:** Where are you from and what was it like growing up there?

A: I am from the burning West, Lautoka. I spent my Primary to High school in Lautoka and stayed with my family. It was great.

**Q:** What do you like to do when you’re not at work?

A: Since my family is in Lautoka I travel home most weekends. I enjoy cooking, watching movies and hanging out with friends.

**Q:** What would you really like to be doing in 10 years?

A: I would like to still be using my geological skills and if deep sea mining commences, I would love to be involved in that. During this period, I also hope to produce a completed geological map of Fiji.

**Q:** What’s the one thing you’d really like to do that you haven’t done yet?

A: Field trip around Middle East to see the geology as they are known for their oil and gold.

**Q:** What’s your favourite movie and why?

A: The Bollywood movie Bhool Bhulaiyaa. It was very entertaining with suspense.

The DSM Project team would also like to extend its warm congratulations to Christine and her fiancé, who were recently engaged. We wish them all the very best for the wedding and a long happy marriage beyond.

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**New Resources**

The DSM Project has developed its 17th Information Brochure ‘Seaﬂoor Massive Sulphides (SMS): Environment, biology, and potential impacts of deep sea mining’. This information brochure provides a summary of comprehensible information of SMS deposits - one of the three main deep sea mineral types. Information brochures on the other two types (manganese nodules and cobalt-rich crusts) are under development.

March 2014 marks the three year anniversary of the establishment of the SPC-EU DSM Project. A special brochure has been put together to highlight the achievements of the DSM Project during this time. These brochures can be accessed on the website:

http://www.sopac.org/dsm/index.php/resources

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**Get Involved**

**DSM Project Internships**

The Legal Internship vacancies are available on a rolling basis to applicants from our 15 member countries. Geological and Environmental Internships may also be applied for and awarded on an as-needed basis. For more information on the internships or to apply, please visit the website: www.sopac.org/dsm

**DSM Project LinkedIn Group**

The DSM Project has set up a LinkedIn Group Page: http://www.linkedin.com/groups/Deep-Sea-Minerals-Project-6646605

LinkedIn is an online professional network that connects people with common interests, creating a space for communities of interested people to discuss particular topics.

The DSM Project represents many Pacific countries and the online nature of the LinkedIn group will provide an opportunity for member countries to interact with each other as well as with other professionals in the DSM field.

If you are interested in the DSM Project, we encourage you to join the group and get involved in the discussions. It is a great way to keep in contact with other States and experts, share experiences and encourages regional coordination and cooperation.

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**Subscribe to this newsletter**

This newsletter is available on the DSM Project’s website, but if you would like to receive it automatically, please email viraa@spc.int