



**SPC-EU EDF10 Deep Sea Minerals (DSM)  
Project**



Pacific ACP States Regional Training Workshop on Geological, Technological, Biological and Environmental Aspects of Deep Sea Minerals

**WORKSHOP PROGRAMME**

<i>Time</i>	<i>Activity</i>	<i>Presenter</i>
<b>Day 1 – Monday 13 August 2012</b>		
8.00 – 9.00am	Registration	All participants
9.00 – 10.30	Brief welcome and introduction	Akuila Tawake (Team Leader – DSM Project, SPC)
	Official Welcome	Russell Howorth (Director – SOPAC Division, SPC)
	Terrestrial Mining and Mineral Resources Potential in the Pacific Islands region: history, mining process, mineral economics, societal impacts, and case studies	Akuila Tawake (SPC)
	<b>Group Photo for workshop participants</b>	
10.30 – 10.45	<i>Morning Tea</i>	
10.45 – 12.30 pm	<b>Session 1 [Overview of Marine Minerals]</b>  Plate Tectonics, geological settings, and types and occurrence of marine minerals, global demand and supply for metals, history and methods of marine scientific research and marine minerals exploration, historical trend of metal prices, uses of metals derived from deep sea mineral deposits	Jim Hein (Senior Scientist, US Geological Survey)
12.30 – 1.30	<i>Lunch</i>	

1.30 – 3.15	<p><b>Session 2 [Overview of Biological Studies Associated with Marine Minerals]</b></p> <p>History of marine scientific research on Deep Sea Biology and the biological communities associated with marine mineral deposits. Connections between the Deep Sea and the Upper Ocean. State of knowledge on deep sea mineral deposits' biology, various methods of marine scientific research on the biology of deep sea mineral deposits</p>	Chuck Fisher (Professor of Biology, Penn State University)
3.15 – 3.30	<i>Afternoon Tea</i>	
3.30 – 5.00	<p><b>Session 3 [Geology and Potential of Manganese Nodules]</b></p> <p>Manganese Nodules – genesis, mode of occurrence, global distribution, metal concentrations, variation in metal concentrations, economic potential, oceanographic and geological conditions that control their formation and metal concentrations, estimate of metal values in a tonne of ore</p>	Jim Hein (USGS)
<b>Day 2 – Tuesday 14 August 2012</b>		
8.30 – 10.15 am	<p><b>Session 4 [Biology of Manganese Nodules]</b></p> <p>Biological communities associated with Manganese Nodules: types, behavior, natural variability, spatial and temporal distribution of different species and communities, function and potential uses of different species, impacts of natural events, data and information available on the biology of manganese nodules</p>	Chuck Fisher (PSU)
10.15 – 10.30	<i>Morning Tea</i>	
10.30 – 12.30 pm	<p><b>Session 5 [Geology and Potential of SMS]</b></p> <p>Seafloor Massive Sulphides – genesis, mode of occurrence, global distribution, metal grades, variation in metal concentrations, economic potential, oceanographic and geological conditions that control their formation and metal concentrations, estimate of metal values in a tonne of ore</p>	Jim Hein (USGS)

12.30 – 1.30	<i>Lunch</i>	
1.30 – 3.15	<p><b>Session 7 [Biology of Seafloor Massive Sulphides]</b></p> <p>Biological communities associated with Seafloor Massive Sulphide: types, behavior, natural variability, spatial and temporal distribution of different species and communities, function and potential uses of different species, impacts of natural events, data and information available on the biology of seafloor massive sulphides.</p>	Chuck Fisher (PSU)
3.15 – 3.30	<i>Afternoon Tea</i>	
3.30 – 5.00	<p><b>Session 8 [Geology and Potential of Cobalt-rich Crusts]</b></p> <p>Cobalt-rich Crusts – genesis, mode of occurrence, global distribution, metal concentrations, variation in metal concentrations, economic potential, oceanographic and geological conditions that control their formation and metal concentrations, estimate of metal values in a tonne of ore</p>	Jim Hein (USGS)
<b>Day 3 – Wednesday 15 August 2012</b>		
8.30 – 10.15 am	<p><b>Session 9 [Biology of Cobalt-rich Crusts]</b></p> <p>Biological communities associated with Cobalt-rich Crusts: types, behavior, natural variability, spatial and temporal distribution of different species and communities, function and potential uses of different species, impacts of natural events, data and information available on the biology of cobalt-rich crusts.</p>	Chuck Fisher (PSU)
10.15 – 10.30	<i>Morning Tea</i>	
10.30 – 12.30 pm	<p><b>Session 9 [Potential of Other Deep Sea Mineral Deposits]</b></p> <p>Occurrence/Potential of Phosphate and Rare Earth Metals in the Pacific Ocean. Economic Potential, Recent trend in the REEs demand and supply, Potential REE contents of Manganese Nodules and Cobalt-rich Crusts, uses of REEs</p>	Jim Hein (USGS)
12.30 – 1.30	<i>Lunch</i>	
1.30 – 3.15	<p><b>Session 10 [History of Marine Mineral Technology Development]</b></p> <p>Technology development in terrestrial mining, oil and gas, military research, submarine cables, etc, technology</p>	Jim Hein (USGS)

	development for marine minerals exploration and mining, exploration and mining technologies in the 1950s to 1980s, early trial mining for manganese nodules and challenges encountered.	
3.15 – 3.30	<i>Afternoon Tea</i>	
3.30 – 5.00	<b>Session 11 [Recent Technology Development and Innovation]</b>  OceanfLORE – Background, technology development and applications, from shallow to deeper water, opportunities & challengers	Kris Van Nijen (General Manager, OceanfLORE BV)
	<b>Group Discussions and Presentations.</b>	
<b>Day 4 – Thursday 16<sup>th</sup> August 2012</b>		
8.30 – 10.15 am	<b>Session 12 [Exploration Advisory Services – Case Study – IHC Mining BV]</b>  IHC Mining BV – Background and core functions with respect to advisory services given to Mining companies in terms of sustainable, exploration and exploitation.	& John Feenan (Director Exploration Advisory Services IHC Mining BV)
10-15 – 10.30	<i>Morning Tea</i>	
10.30 – 12.30 pm	<b>Session 14 [Environmental Impacts of terrestrial mining]</b>  Environment impacts of terrestrial mining on terrestrial environment and coastal zones, mining waste management, Case Studies in the Pacific region, comparison to potential impacts of seabed mining	Akuila Tawake (SPC)
12.30 – 1.30 pm	<i>Lunch</i>	
1.30 – 3.15	<b>Session 15 [Environment Impacts of Deep Sea Minerals Exploration and Mining]</b>  Marine scientific research activities and impacts, deep sea minerals exploration and exploitation (for manganese nodules, seafloor massive sulphides and cobalt-rich crusts) and likely impacts of each activity and suggested mitigating measures, potential impacts on ocean living resources, application of the precautionary approach, comparing potential adverse impact of deep sea mining and	Chuck Fisher

	other human activities in the ocean (e.g. deep sea trawling, waste dumping), available data and information of DSM environmental surveys	
3.15 – 3.30	<i>Afternoon Tea</i>	
3.30 – 5.00	<b>Session 15 continued.</b>	Chuck Fisher (PSU)
6.00 – 8.00	<b>Workshop Cocktail</b>	All Participants
Day 5	<b>Friday 17<sup>th</sup> August 2012</b>	
8:30 – 10.15	<b>Session 16 Fishery Resources in the Pacific and Concerns on the Potential Impacts of Deep Sea Mining</b> Fishery Resources in the Pacific – subsistence and commercial, fishing market, \$\$ value (e.g. Tuna), seasonal migration patterns, tuna species seasonal aggregation/distribution, concerns on potential impacts of deep seabed mining likely impacts that may affect fisheries.	Malcom Clark (NIWA) and Ashley Williams (Fisheries Scientist, FAME Division, SPC)
10.15 – 10.30	<i>Morning Tea</i>	
10.30 – 12.30	<i>Group Discussions and Exercise</i>	
12.30 – 4.30	- <i>Group Presentations;</i> - <i>Certificate Presentations; and</i> - <i>Workshop Closing</i>	