Role of the Pacific Island Nations in the Development of their Energy, Mineral, and Geo-Resources Security through Urban Sea Systems

CPC-STAR WORKSHOP REPORT

The CPC in cooperation with the STAR Network held a two-day workshop November 24-25, 2025, in Suva, Fiji, sponsored by Integral Consulting, Inc, and Wetstone Global, Inc., and addressed the regional Pacific Basin interests and concerns about deep-sea minerals and the potential exploitation of these seafloor resources. The objective of the workshop was to mobilize information on the benefits and potential impacts of deep-sea mining in a regional context that applies to Small Islands Developing States' (SIDS) Urban Sea Systems. In this context Urban Sea Systems are the countries' major port cities that potentially may be affected by deep-sea minerals extraction. This workshop was a continuation of the Urban Sea Systems STAR special session and one day workshops held in Suva during the STAR sessions of 2023 and 2024 and included over 60 attendees.

Day 1

During the Introduction of the workshop in day 1, brief histories of STAR and CPC were presented followed by a short description of Urban Sea Systems and why they are important to SIDS (see attached workshop agenda). These presentations were followed by introducing the workshop participants to deep-sea mining potential in the SIDS region along with a brief review of mining in the SW Pacific countries.

During the session on "Regional Input" the Cook Islands' participants presented a comprehensive review of mineral resources assessment of polymetallic nodules in their EEZ, their marine assessment of the seabed, and the regulatory framework for responsible seabed minerals activity. This was followed by sharing information on the U.S. Territories of American Samoa and the Commonwealth of the Northern Mariana Islands, the evaluation of the environmental and economic trade-offs of offshore industries, and the presentation of the latest GEBCO map. Day 1 ended with a recap and the day's presentations and questions from the participants. For further information go to: https://www.star.org.fj/pastconferences, see "2025 VIEW ALL, Mon.".

Day 2

On the Day 2 of the workshop, "Deep Ocean Mining (DOM) Technologies/Industry Perspectives" were presented that included the deep-sea environmental assessment through purpose-driven seafloor mapping and imaging, the use of the low-cost benthic AUV Orpheus, the

modernization of the Port of Suva that could be instrumental in servicing deep-sea mining activities, a company perspective that covers the whole gamut from exploration/extraction to refining and marketing, the real-time data processing and delivery capabilities, and a digital twin approach to climate resilience (see attached agenda; https://www.star.org.fj/pastconferences, see "2025 VIEW ALL, Tues." for presentations provided during the workshop). The industry presentations were followed by a brief session on legal considerations with mining. To complete the presentations the Fiji Mineral Resources Department (MRD) briefly described the Fiji perspective of deep-sea minerals indicating that Fiji was seriously looking at seafloor mining in an ecological responsible manner and will be engaged in writing regulations for such activities.

Participants Input and Map Interpretation Exercise

All attendees participated in the evaluation of CPC maps and charts used to assist them in locating and understanding the physical, environmental, potential resources, and economic conditions of their island's Urban Sea System (see attached Urban Sea Systems Maps Worksheet). This exercise, facilitated by CPC staff, was instrumental in expanding SIDS participants' abilities to read geological maps and draw conclusions critical to appraising the potential deep-ocean mining activities. The CPC Mapping Project resources used for this exercise are detailed below. Briefly, these sets of maps are at 1:10,000,000 scale and detail the geologic, plate tectonic, mineral and energy resources, and geodynamic details of the southwest pacific region.

Results and Conclusions

Attendees appreciated the workshop and indicated that it was successful in communicating up-to-date information about coming deep-ocean mining activities. Several participants stated that while deep-ocean mining was of concern to their countries, they were experiencing something more critical to them and that was the spread of narcotics and dope throughout their island communities. They wondered how this can be controlled and if the mining activities may exacerbate this problem.

The maps used in the mapping exercise were provided to Fiji MRD for their use in deep-sea minerals assessment and with the intent to digitize them for distribution among other government agencies. Many participants indicated a desire to have copies for their use and CPC offered to investigate the possibility of compiling and digitizing all CPC maps in its archives. A strong compelling signal from the attendees for CPC and STAR to organize a similar workshop for the STAR 2026 Sessions was put forward. Based on this encouraging communication CPC agreed to organize and convene a follow-up workshop to be held in Suva Fiji preceding the STAR sessions of 2026.

Note: Based on the STAR-Urban Sea Systems field trip of Suva Harbor where a request from the Fiji government to assist in obtaining an MBES system for MRD and provide training in its use was made, CPC and Integral joined together to seek funds to provide a capacity building training

session. This resulted in funds being provided by the Integral Charitable Foundation and Wetstone to plan and convene a capacity building training session in Suva November 13-14, 2026.

ATTACHMENTS:

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A STAR-CPC WORKSHOP

November 24-25 – Suva, Fiji

DAY 1

Introduction – Call to order

1015 **CPC Welcome** – Chairman Ed Saade (5 min.) (V)

1010 **Brief History of STAR** – Russell Howorth (10 min.) **A**

1030 **Brief History of CPC** – Gary Greene (10 min.) **A 1**

1045 **Agenda** – Review of Workshop agenda – Gary Greene (5 min.) **2**

1035 **Urban Sea Systems - What are they, do SIDS have them?** – Gary Greene (25 min.) **A 3**

Review

1105 **Introduction of DSM in SIDS Region** – Ed Saade (V)/Gary Greene (20 min.) **A 4 a**

1125 **Mining Potential of Deep-Sea Minerals in the Pacific region and the Univ. of Hawaii History of Exploration** – Gary M. McMurtry, Univ. of Hawaii (20 min.) **A**

1145 **A Brief Overview of Mining in Some SW Pacific Countries** – Robert Smith (20 min.)

1200 **Lunch**

Regional Input

1300 **Mineral resources assessment for polymetallic nodules in the Cook Islands exclusive economic zone** – Rima Browne, J.M. Parianos, Cook Islands (30 min.?) **A**

1330 **Cook Islands Marine Spatial Assessment for the seabed** – Rima Brown, John Parianos, Cook Islands (30 min.?) **A**

1400 **The Regulatory Framework for Responsible Seabed Minerals Activities in the Cook Islands** – Latisha Maui, Cook Islands (30 min.?) (V**?**) **A**

1430 **USA Territories: American Samoa and Commonwealth of the Northern Mariana Islands (CNMI)** – Ed Saade/Gary Greene (30 min.) (V) **A b**

1500 **Break**

1530 **Evaluating the environmental and economic trade-offs of offshore industries** – Tracy Mangin, UCSB (for BOEM) (V) **A** (30 min.)

1600 **The General Bathymetric Chart of the Oceans (GEBCO) Strategy 2024-2030** – J.W. Maschke (20 min.) **A**

1620 **Recap and Questions? Outline for next day's sessions** – Gary Greene

1700 **End Day 1**

DAY 2

DOM Technologies/Industry Perspectives

0900 **Advancing Deep-Sea Environmental Assessment through Purpose-Driven Seafloor Mapping and Imaging** – Daniel Doolittle, Integral Consulting (20 min.) **A**

0920 **Low-Cost Deep Ocean Benthic AUV(s)** – Jake Russell Orpheus Ocean (20 min.) (V)

1000 **Break**

1030 **Modernization of the Port of Suva** – Isikeli Tuituku/Tomasi Sauqaqa, Port of Suva (20 min)

1040 **From Extraction to Refining** – Sahil Abbi/Daniel Worrall, Wetstone (20 min) (V)

1100 **Real-Time Remote Data Processing and Delivery** – Ed Saade Fugro (20 min.) (V) **A c**

1120 **Smart Coast and Net Ecosystem Value: A Digital Twin Approach to Climate Resilience in the Torres Strait** – Paul Seaton, Costal Resilience Lead, Americas and Australia, Fugro (20 min.) (V)

1140 **Questions**?

1200 **Lunch**

Legal Considerations

1300 **Law of the Sea Pacific Island States Summaries: Impacts, Possibilities and Concerns from Maritime Seabed Resources to Sea Level Rise** – Ed Saade and Rob van de Poll, Fugro (20 min.) (V) **A d.**

1320 **Just Progress? Law and Legitimacy in Deep Ocean Mining** – Judge Matthew Segal Pacifica Law Group (20 min.) V

Participants Input

1320 **Digestion and Planning: (**Data and knowledge represent power – know the situation, conditions, and activity through understanding and monitoring)

1400 **Break**

1430 **Deep-Sea Minerals – A Fiji Perspective** – Apete (30 min.)

1500 **Identification of SIDS Urban Sea Systems** – Gary Greene **A 5**

A map exercise – participants to pick their sites of interests on maps

UrbSeas potential role in DOM – Participants (plot their UrbSeas on maps)

Interactive involvement with SIDS (illustrate geographic relationships with potential mineral extraction sites to receiving and supporting regional ports – (All attendees)

1530 **Reconvene** – **Discussion** on results, problems, and way forward.

Data and knowledge represent power – know the situation, conditions, and activity through understanding and monitoring.

1630 Wrap up – what next.

1700 **End Day 2**

End Workshop

Urban Sea Systems Maps Worksheet

Maps 1-3 CPC Geographic Maps (Pacific Basin, SW Quadrant, SE Quadrant)

Pick your country – areas of interest:

Note your location by depth (shallow, deep):

Note physiography (Abysssal Plain, ridge, seamount, Island):

Maps 4-5 CPC Plate Tectonic Maps (Pacific Basin, SE Quadrant)

Find and note your Tectonic Setting (Intra-plate, Spreading ridge, subduction, hot spot):

Maps 6-7 CPC Geodynamic Maps (Pacific Basin, SW Quadrant)

Find and note your geodynamic setting (seismicity, volcanism, temperature):

Map 8 CPC Tectonostratigraphic Terrane Map (Pacific Basin)

Find and note the location of terrane for your country:

Map 9-10 CPC Mineral Resources Map (SW Quadrant, SE Quadrant)

Find and note locations of potential mineral resources in your EEZ (crust, SMS, MS):

Map 11 CPC Natural Hazards Map (Pacific Basin)

Find and note type of natural hazard for your country:

Assessment: Combine results of findings above to assess your county's DSM potential, Urban Sea System vulnerabilities, and outreach/educational aspects using maps.