

Contribution of Science, Technology and Innovation to Sustainable Development

by Mr. MORIMOTO Koichi

Q1: Do you have any plans to hold an face-to-face seminars in island countries like the one previously held in Fiji after the pandemic is over?

When the COVID-19 pandemic is over, we will be happy to host a face-to-face seminar in a Pacific island country in the same way as we had held in Fiji last year.



Q2: Is there, by any chance, a plan to conduct a similar course near future?

I am highly interested in this course. I previously joined marine geology research in the sea around Belitung Island in Indonesia with a research vessel called Baruna Jaya VIII for about 10 days. I felt this marine research provides tremendous profit to broaden the knowledge of fellow researchers.

However the situation of pandemic still remains unpredictable, we will seriously consider re-organizing a training course in Japan with a research vessel, including classroom lectures, laboratory tours, as well as on-board training.



New concept of marine environmental survey & monitoring

by Dr. YAMAMOTO Hiroyuki

Q1-1: High-resolution image proves to provide tremendous aid in biota observation by using the naked eye. Does it imply that near future microscopic observation won't be required anymore?

Q1-2: If a high-resolution camera could substitute the use of a microscope, seeing that a high-resolution camera must be quite high on price, is it considerably feasible to use a high-resolution camera for a large-scale application?

You can choose the underwater camera system depending on the target of monitoring. The low cost 8K camera is available as commercial products. To install the underwater system, you need the technical costs, e.g., lighting unit, optical design of lens, focus control device, etc. In the case of deep-sea, the lighting is a limiting factor to extend the visible area.

The underwater microscopes for microbes and small particles are available. The optical mechanism of this camera system is holography that enables it to focus on a small area or space under drifting conditions.

The microscope used in the laboratory is an indispensable device for research, and the advanced microscope provides analytical functions.

Reference:

Noah L. Walcutt, et al. 2020. Assessment of holographic microscopy for quantifying marine particle size and concentration. *Limnology and Oceanography Methods*, 18: 516-530,

<https://doi.org/10.1002/lom3.10379>



Q2: How will each country respond to the marine environment evaluation technology recommended by the ISA? Are there any penalties?

The ISA requests the data collection from the Area, and provides the information on the methods recommended by the ISA committee. The contractor's countries must submit the data of environmental survey and monitoring by using the recommendation of ISA. The penalty may be the loss of contract for the mining area, if the contractor failed to submit the data to the ISA.



Introduction of the Edokko Mark1

– a small lander to monitor the ocean floor

by Dr. MIWA Tetsuya

Q1: I would like to ask about the CTD in Edokko Mark1. Apart from temperature, acidity, salinity, etc., is it possible for Edokko Mark1 to collect a water sample from the depth? I am wondering if, for example, there is a hydrothermal vent at the seafloor, it must be useful to analyze the chemical content of the water surrounding the vent.

Thank you for your inquiry. As you pointed out, it is very important to measure the chemical content of water samples for habitat monitoring. At the moment, CTD is the most commonly used water sampler. Since Edokko-Mark 1 is a small device, a water sampler must also be small, light-weight, easy to mount on the Edokko monitoring system.

Although we have not attached water samplers on Edokko so far, installation of a water sampler is one of the future Edokko applications.



ISO standards for marine environment impact assessment for sea-bed exploration and exploitation

by Prof. YOSHIDA Koichi

Q1: I would like to ask about the ISO 23040. Is the specification of marine sediments in seabed areas conducted in regards to the biodiversity of the seabed biota only? Is there by any chance other objectives of the marine sediments specification (for example, mineral composition of the marine sediment to trace the origin, the geological or tectonic history, etc)?



Following is the scope of ISO 23040.

This standard outlines the basic requirements for marine sediment interstitial biota surveys and, establishes the general guidelines and technical methods for the survey of marine sediments, foraminifera, ostracoda, radiolaria, diatoms, coccoliths, sedimentary sporopollen, benthic viruses, benthic microbes (including bacteria, archaea and fungi), benthic microalgae, benthic protozoa and metazoan meiobenthos in interstitial sediments. This standard is applicable to marine surveys in diverse benthic habitats such as the coastal zone, shallow seas, seabed areas and deep sea waters.

Therefore, the standard is applicable to biota surveys other than those at sea-bed. However, in order to trace the origin, the geological or tectonic history, it would be necessary to use other analytical technics and technologies than specified in this standard.

Q2: How will ISO standardization respond to the future development of environmental survey technology?



ISOTC8SC2 and SC13 are able to develop ISO standards for environmental survey technologies, If and incase someone within these SC put proposals to develop such standards.

ISO is for users to develop any standards that has a demand of the users.