

Agenda Item 2.6

Nippon Foundation-GEBCO Projects Management committee report 2024

Submitted by Robin Falconer

SUMMARY

Action to be taken: See paragraph 2.6.8

Related documents: None

2.6 NIPPON FOUNDATION PROGRAMMES

2.6.1 Nippon Foundation - GEBCO Overview

GEBCO has had a relationship with The Nippon Foundation (NF) since 2004. The total contribution by NF to GEBCO related activity since 2004 is approximately USD \$45M. The most recent year is approximately \$4.7M. The longstanding partnership with The Nippon Foundation is fundamental to much of GEBCO's work

Major elements that NF have funded include: The Nippon Foundation/GEBCO Training Program in ocean mapping at the University of New Hampshire (UNH) every year since 2004. The Monaco Forum on the Future of Seafloor Mapping held in June 2016. That led to the establishment of the Seabed 2030 project. The NF-GEBCO Alumni team participation in the Shell Ocean Discovery XPRIZE competition in 2017 and 2018. The team won the \$4M first prize; and all that money has gone back into Seabed 2030 and alumni activities. In 2022 NF supported investigations of the volcano that erupted in Tonga in February. In 2023 NF hosted a meeting of alumni and invited experts for a three-day meeting in Tokyo.

2.6.2 Seabed 2030

Establishment of the joint NF-GEBCO Seabed 2030 project has been a major milestone for GEBCO. Funding for Project Year 7 (August 2023 to July 2024) was \$3.2M. Seabed 2030 is described in a separate report and covered elsewhere in the agenda.

2.6.3 University of New Hampshire training program

The Nippon Foundation – GEBCO Training Program in ocean mapping at UNH is in its 21st year. In addition to the six students currently at UNH, 120 scholars from 50 countries have been through the course.

Full details of the program are provided in a separate report.

A review of the training program was carried out in 2023 to ensure that it will meet future needs. Alumni submitted their ideas of potential change and/or additions to the program. Others involved in the program also provided input. Several new components are being considered, including the possibility of extending the length of the program.

The GEBCO Governance review discussed the relationship between the training program and the Subcommittee on Education and Training (SCET). Further development of any discussion, which must include The Nippon Foundation and the University of New Hampshire, will await GGC action on an implementation plan for recommendations of the governance review.

2.6.4 Tonga volcanic eruption response

In January 2022 Tonga was severely impacted by a tsunami and ash fall from the Hunga Tonga – Hunga Ha’apai, HTHH, volcanic eruption. In rapid response The Nippon Foundation provided funding to NIWA of New Zealand for RV Tangaroa Seabed 2030 survey work and additional research. The Nippon Foundation also fully funded the deployment by SEA-KIT Ltd of UK of the 12m USV they had designed and built for the XPRIZE competition. The USV was freighted to Tonga and operated for 30 days completely controlled by SEA-KIT from their premises in the UK. MBES bathymetry was obtained of all of the HTHH crater and some of the surrounding area. Alumni of the NF-GEBCO UNH training program lead the USV program planning and remotely processed the MBES data from six locations around the world.

In addition, NOAA provided oceanographic sensors that were lowered to 300m depth from the USV. Deployments were directed in real-time by NOAA PMEL in Seattle and GNS Science in Wellington through SEA-KIT in UK. Reviewers of a recent NOAA and GNS publication found the novel use of the uncrewed vessel, operated from 16,000 km distant from the study site for this work to be not just innovative, but "revolutionary" and "a paradigm shift" in how we can approach geological monitoring of submarine volcanoes.

The Tonga program was funded by The Nippon Foundation for a total of approximately US \$1.8M. Research and publications using the data obtained in 2022 continues. So too does media coverage of the volcanic event and the NF funded program. The project is an outstanding example of the technical and human resource capability The Nippon Foundation - GEBCO partnership has developed over the last 21 years.

2.6.5 Related Seabed Mapping projects

The Nippon Foundation and the Sasakawa Peace Foundation are active in many areas of global ocean issues, including policy, governance, education, research and outreach. Several of their activities are related to seabed mapping. Two recently commenced programs are good illustrations. Together they represent a USD 750k contribution to seafloor mapping.

Ocean Shot Research Grants.

In 2023 applications for Ocean Shot projects were advertised. Four projects were selected from 30 applications. One, Next Generation Seafloor Mapping Tools, is directly related to seafloor mapping. It's initial funding is USD 400k.

Next Generation Seafloor Mapping Tools

For the project four leading research institutions specializing in ocean mapping problems (Scripps Institution of Oceanography, Stockholm University, JAMSTEC and the University of New Hampshire) have joined forces on three interconnected tasks.

a) Utilizing new generation satellite data collected on the SWOT mission to hopefully double the lateral resolution of satellite altimetry-derived bathymetry. b) Exploring how machine learning may potentially be used to produce higher resolution data and find errors in the bathymetric products. c) Using the new technology of NEMO floats (Novel Echosounder to Map the Ocean) to ground-truth the satellite derived bathymetry and marine learning predictions; and demonstrate the use of free-floating drifting profilers collecting global bathymetric data for long periods of time in remote areas of the ocean.

Projects led by graduates of NF-GEBCO Training Program at UNH.

In association with the Nippon Foundation - GEBCO UNH Alumni Conference in Tokyo in August 2023 a competitive process was run for seabed mapping projects to be led by alumni. Two projects were selected and received total initial funding of USD 350k. These projects are currently underway.

1) Bathymetry of the Western Indian Ocean

The project will identify existing bathymetry data, collect and consolidate it, and produce an up-to-date bathymetry map of the Western Indian Ocean. The project is led by Dr Amon Kimeli, of the Kenya Marine and Fisheries Research institute, Mombasa, Kenya. Dr Vicki Ferrini of Lamont Doherty Earth Observatory is a co-lead. Dr Kimeli is a graduate of the NF-GEBCO training program at the University of New Hampshire.

2) Open-source processing software (MB-System) workflows

The project focuses on the development of the open-source MB-System software and documentation; and accessing existing MARUM data. The project is led by Dr. Evgenia Bazhenova at MARUM (Centre for Marine Environmental Sciences), University of Bremen, Germany. Dr Bazhenova is a graduate of the NF-GEBCO training program at the Univ of New Hampshire.

2.6.6 NF Project Management Committee status

The NF Project Management Committee has oversight, on behalf of the GGC, of the Nippon Foundation Training Program at UNH and other NF funded projects; not including Seabed 2030. Current members are Robin Falconer (chair), Shin Tani, Martin Jakobsson, Hugo Montoro, Taisei Morishita, Dave Monahan and Rochelle Wigley.

The GEBCO Governance review briefly discussed the relationship between the committee and the GGC. Further development of any discussion, which must include The Nippon Foundation, will await GGC action on an implementation plan for recommendations of the governance review.

2.6.7 Recognition

The GGC, on behalf of the IOC-IHO GEBCO Project, recognizes with great gratitude The Nippon Foundation for its range of partnerships with the GEBCO Project over the past 21 years. GEBCO looks forward to a continuing relationship, especially with the Nippon Foundation-GEBCO Training Program alumni from UNH, and the Nippon Foundation – GEBCO Seabed 2030 project.

2.6.8 Action

The GGC is requested to:

- a) Note the contents of this report
- b) Note that interaction with the GGC and SCET is required on the future status of the NF Project Management Subcommittee and any relationship with the Nippon Foundation – GEBCO training program at UNH. Any interaction must incorporate The Nippon Foundation.
- c) Note that the total contribution of The Nippon Foundation to GEBCO related activity since 2004 is approximately USD \$45M and the most recent year is approximately \$4.7M. The longstanding partnership with The Nippon Foundation is fundamental to much of GEBCO's work.
- d) Express to The Nippon Foundation the gratitude of the GGC for the Nippon Foundation's continued support of the GEBCO Project, of the UNH Training Course, and of the Nippon Foundation – GEBCO Seabed 2030 project; and
- e) Take any other action deemed appropriate.