



International Seabed Authority
ENDOWMENT FUND
Collaborative Marine Scientific Research



The International Seabed Authority is responsible for organizing and controlling all mineral-related activities that take place in the international seabed area. This is an enormous task: the ocean floor in the international seabed area covers more than 50 per cent of the world's surface.

Mineral-related activities are also highly diverse: prospecting may target polymetallic nodule deposits and sulphides on the ocean floor or minerals embedded in cobalt-rich crusts; and mining may take place in depths of up to 6,000 metres and along biologically rich ocean floor areas, such as seamounts and hydrothermal vents.

As a global resource, scientific study in the international seabed area should include, wherever possible, scientists and researchers from both developing and developed countries. To achieve this objective, the member States of the International Seabed Authority established an endowment fund in 2006.



"If the concept of the common heritage of mankind is to mean anything, it is essential not only that the benefits of the resources of the deep seabed be shared amongst all States, but also scientific knowledge."

*10 December 2007,
Secretary-General Satya N. Nandan*

Polynoid worm – a type of polychaete worm commonly called scale worms. Image courtesy of Adrian Glover

The Fund

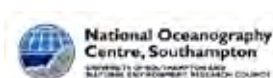
The Endowment Fund promotes the conduct of collaborative marine scientific research in the international seabed area by supporting the participation of qualified scientists and technicians from developing countries in relevant programmes, initiatives and activities.

The Secretariat of the Authority facilitates these activities by maintaining a list of opportunities for scientific collaboration, including research cruises, deep-sea sample analysis and training and internship programmes. This entails building a network of cooperating groups interested in (or presently undertaking) these types of activities and programmes, such as universities, institutions and contractors with the Authority. Members of the network to date include the National Oceanography Centre (United Kingdom); the National Institute of Ocean Technology (India); the French Institute for the Exploitation of the Sea (IFREMER); the Federal Institute for Geosciences and Natural Resources (Germany); the National Institute of Oceanography (India); the Natural History Museum (United Kingdom); Duke University (USA); and InterRidge, an international, non-profit programme promoting interdisciplinary studies of oceanic spreading centres.

Application guidelines have been prepared for potential funding recipients to participate in marine scientific research programmes or other cooperative scientific activity, to enrol in training programmes, and to qualify for technical assistance. An advisory panel evaluates all applications and makes recommendations to the Secretary-General of the International Seabed Authority for the award of funding assistance.

Terms of Reference for the ISA Endowment Fund, guidelines for applications, the marine scientific research and training opportunities list, and other information on the Fund may be found at www.isa.org.jm/en/E-Fund.

To maximize the potential of the Fund, the Secretariat is also seeking donations and in-kind contributions to build on the initial investment of US\$3 million. During 2008 and 2009, contributions were received from the governments of Germany, Mexico, Norway, Spain and the United Kingdom.





Benefits of the Fund

Scientific, Social, Developmental, And Environmental

Activities and programmes promoted through the Fund fulfill social, scientific, development and environmental criteria that are intended to benefit the world as a whole:

- **Social.** The Fund facilitates the transfer of multi-disciplinary skills to scientists and technicians from developing countries by providing opportunities for the practical application of knowledge and scientific research techniques. It also fosters collaboration by linking scientists from developed and developing countries to share and build on their skills, knowledge and expertise in marine scientific research.
- **Scientific.** The Fund gets the most from scarce scientific research funds by encouraging collaboration and partnership in research projects that can be very costly. It also links scientists from around the world to an international network of deep-sea researchers and scientists that encourages collaborative research and the sharing of information. Finally, the Fund expands the knowledge base of the deep-sea environment, which is both vast and under-researched.
- **Developmental.** The Fund encourages information gathering on deep-seabed mineral resources and biodiversity, and the effects of human activity on the deep ocean. This information allows the International Seabed Authority to improve its regulations for deep-sea mining. Deep-sea exploration organisations may also use this information to improve their preparations for future mining activities.
- **Environmental.** The Fund promotes increased scientific research in the deep sea, where biodiversity, ecosystem and marine resource dynamics may not be fully understood. By expanding knowledge in this area, the Authority and exploration entities under contract with the Authority can ensure that the effects of future mining and prospecting activities do not cause undue harm to the deep-sea environment.

Funded Activities

To date, six awards have been made by the Endowment Fund, totalling over US\$250,000, and benefitting 16 scientists and technicians from 14 developing countries: Argentina, Bangladesh, China, Egypt, Guyana, India, Indonesia, Mauritania, Nigeria, Papua New Guinea, the Philippines, Sri Lanka, Thailand and Viet Nam.

Above left: An anemone from the Lau Basin, South Pacific. Image courtesy of the National Science Foundation Ridge 2000 Program and Charles Fisher, Penn State University.

Inter-Ridge/ISA Post Doctoral Fellowship Program

Funded by the International Seabed Authority

The first project to receive funding was proposed by InterRidge, an international, non-profit programme that promotes interdisciplinary studies of oceanic spreading centers. The funding allowed InterRidge, which is currently based at the National Oceanography Centre, Southampton, to offer two fellowships each year under the 'InterRidge Student Fellowship Program,' to encourage students to incorporate an international component to their research in ridge-crest science. The fellowships will run between 2009 and 2011, and each is worth US\$5,000. Suitable candidates are encouraged to find out more information from the InterRidge website (<http://www.interridge.org/fellowship>).



The Endowment Fund will allow Surya Prakash, a Ph.D. candidate from India, to analyse helium isotopes in water samples collected in a systematic survey of the Carlsberg Ridge in the Indian Ocean, to confirm the existence and source of a hydrothermal plume in the region. He says, "This fellowship will give me an opportunity to learn the analytical techniques for estimation of dissolved helium isotopes in sea water, using a noble gas mass-spectrometer. The technique and facilities are not available in India, and are at present in only a few laboratories in the world."

Multi-disciplinary Research Program

Funded by the International Seabed Authority

The Endowment Fund has also supported the participation of two Indian scientists in a multi-disciplinary investigation aimed at expanding knowledge of continental break-up and associated depositional basins at Shag Rock Passage in the North Scotia Ridge in the western South Atlantic. The funding was utilised to cover travel costs and sample analysis. The programme of research will create a network of cooperating scientists that share the same scientific goals, and enable them to share and build on the individual skills, knowledge and expertise they have gained in their chosen fields of marine scientific research. The funding beneficiaries will, in turn, be able to transfer the analytical geochemical skills they have learned to other scientists in their home country.

NIO/ISA Technical Assistance Program – Marine Scientific Research *Funded by the International Seabed Authority and the National Institute of Oceanography, India*

Funding has been provided to enable three scientists from developing countries to gain new skills and carry out a research project at the National Institute of Oceanography (NIO) in India. During their training, which included a field trip aboard NIO's coastal research vessel, Sagar Sukti, the participants were acquainted with topics related to the exploration and environment of deep seabed minerals and given hands-on experience with relevant techniques. The fellowships were awarded under the Technical Assistance Program-Marine Scientific Research (TAP-MAR) initiative. The wide-ranging course, which ran between 29 October and 19 December 2009, incorporated marine surveys for interdisciplinary research, exploration of marine minerals and resource evaluation, assessment of the environmental impact of offshore projects on marine ecosystems and biodiversity, Law of the Sea training, practical training in laboratory and field techniques and report writing under the individual supervision of scientists. Under the programme, participants were supplied with accommodation, office and laboratory space, and access to NIO library facilities.

“This training program is very much relevant to my future research work and the experience gained through this program will be help to develop similar kind of research in aquatic resources of Sri Lanka... exposure to the eminent scientists in NIO will help to develop collaborative research activities in future, including training in developing fields of marine and aquatic science. Finally, this is a very good program to bring the scientists working on different themes together and focus on common problems related to [the] marine environment.

*– Niroshana Wickramaarachchi,
Sri Lanka*



*TAP-MAR fellowship awardees in training.
From left: Alejandra Mariana Rocha of Argentina,
Niroshana Wickramaarachchi of Sri Lanka,
Sanjeev Afzal Purkar, NIO Scientist and
Olubunmi Nubi of Nigeria*

Rhodes Academy of Oceans Law and Policy

Funded by the International Seabed Authority

In March 2009, an award was made to the Rhodes Academy of Oceans Law and Policy to fund a number of student fellowships for individuals from developing countries, and to expand the Academy's training programme to cover issues relating to marine science. The Rhodes Academy was founded in 1995 and entails an intensive, three-week course of study, with lectures by leading jurists, practitioners, and international law faculty from around the world. It is a cooperative undertaking sponsored jointly by the Centre for Oceans Law and Policy (University of Virginia, Charlottesville, United States), the Aegean Institute of the Law of the Sea and Maritime Law (Rhodes, Greece), the Law of the Sea Institute of Iceland (Reykjavik, Iceland), the Max Planck Institute for Comparative Public Law and International Law (Heidelberg, Germany), and the Netherlands Institute for the Law of the Sea (Utrecht, the Netherlands). More than 400 students from 96 different countries have graduated from the Academy since its establishment. Nine participants benefited from support by the Endowment Fund to take part in the 14th Session of the Rhodes Academy of Oceans Law and Policy.

"The interaction with [the] marine science faculty and marine science students is meaningful and valuable... the academic content of the course includes almost all current hot issues or contentious debates."

– Ms. Jaiyu Bai, China



Student fellows undergoing training at the Rhodes Academy of Oceans Law and Policy

Collaborative Research – Papua New Guinea and Duke University, USA

Funded by: International Seabed Authority

An award from the Endowment Fund is enabling collaborative research between Duke University and a researcher from Papua New Guinea to develop conservation strategies for Seafloor Massive Sulphide ecosystems. The study will focus on the genetic diversity of selected marine invertebrate taxa from the Manus Basin in the Bismark Archipelago near Papua New Guinea, and will cover the population structure and classification of species. It is hoped that information generated by this study will help develop the knowledge and understanding of these ecosystems and aid Papua New Guinea in employing adequate conservation strategies.

Endowment Fund recipient, William Saleu of Papua New Guinea. Image courtesy of Nautilus Minerals.



Past Successes

Encouraging marine scientific research in the international seabed area has been a key pillar of the International Seabed Authority's mandate since it was established in 1994. The Authority and its partners have undertaken collaborative marine scientific research aimed at enhancing the ability to predict and manage the impacts of deep-seabed mining and increasing international knowledge of the deep-seabed environment. Some of the past collaborative marine science projects the ISA has been involved with, and which have informed the establishment of the Endowment Fund, are outlined here.

- **KAPLAN Project: Analyzing Biodiversity, Species Ranges and Gene Flow in Nodule Areas of the Seabed**



A potentially new foraminifera species found as part of the Kaplan project. Image courtesy of Nina Okhawara, JAMSTEC

The Kaplan Project is the first and most successful attempt to analyze species composition and rates of gene flow of living organisms across the abyssal plains of the Clarion-Clipperton Zone in the Central Pacific Ocean. It is also an excellent example of how collaborative marine scientific research is being used by the International Seabed Authority to minimize the risks of mining activities to deep-sea biodiversity in this Zone.

- **CenSeam Project: Assessing Biodiversity Patterns on Seamounts to Identify Knowledge Gaps**

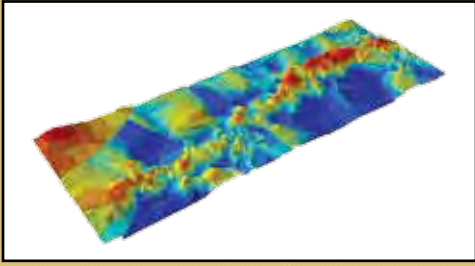


A species of coral collected as part of the CenSeam campaign. Image courtesy of NOAA, WHOI, the Alvin Group and the 2004 GOA Seamount Exploration Science Party

CenSeam is a programme within the Census of Marine Life which aims to determine the role of seamounts in the biogeography, biodiversity, productivity and evolution of marine organisms, and to evaluate the effects of human exploitation on seamounts. The International Seabed Authority is partnering with CenSeam to assess the patterns of biodiversity on seamounts and the factors that determine these patterns in order to identify the gaps in current knowledge, and encourage

collaborative research initiatives that will address them. The results of this project will also be used by the Authority to minimize the risks of mining activities on deep-sea seamounts.

- **Geological Model Project: Metals of Commercial Interest in Polymetallic Nodule Deposits of the Clarion-Clipperton Zone**



The Geological Model is a comprehensive appraisal and representation of the quantity, distribution and metal content of polymetallic nodule deposits in the Clarion-Clipperton Zone. It provides exploration entities under contract with

the International Seabed Authority and future mining prospectors with a detailed mineral resource assessment of the Zone. It also contributes to scientific knowledge of how these deposits form and the marine variables that may contribute to nodule formation and abundance. The project includes a prospector's guide that lists the proxy indicators for nodule distribution along the seabed for use by prospectors and explorers in future seabed mining exploration.

- **Kaiser de Souza, Marine Geologist
Chief, Division of Marine Geology
Geological Survey of Brazil, Ministry of Mines and Energy**



Kaiser de Souza was beneficiary of a training programme offered by one of the Authority's contractors, as a participant in the IFREMER-AFERNOD 12-month training programme related to international seabed mineral prospecting. He began the first phase of training in 1993 at the Centre d'Enseignement Supérieur en

Exploration et Valorisation des ressources minérales in Nancy France. The second phase of his training was led by IFREMER where he participated in a month-long oceanographic research cruise onboard the L'Atalante to study the morphobathymetric and geophysical coverage of New Caledonia's exclusive economic zone. Today, Kaiser is the Chief of the Division of Marine Geology at the Geological Survey of Brazil, which is part of the Brazilian Ministry of Mines and Energy where his responsibilities are focused on the implementation of the National Programme for the Evaluation of the Mineral Resources Potential of the Brazilian Continental Shelf.

Future Projects

During 2010, an international cooperative study on the seafloor hydrothermal system in the Indian Ocean will be carried out using financial support from the Endowment Fund and investigation cruises organized by the China Ocean Mineral Resources Research and Development Association (COMRA). The study focuses on the tectonic environment and hydrothermal mineralization at the Southwest Indian Ridge. As part of this programme, two scientists from developing countries will receive training during a research cruise aboard R/V Dayangyihao, and an international capacity building workshop will be held. It is expected that this collaboration will result in an international cooperative project between COMRA and the Authority.

The Secretary-General encourages members of the Authority, other States, relevant international organizations, academic, scientific and technical institutions, philanthropic organizations, corporations and private persons to contribute to the Fund, which is one of the key mechanisms for enabling capacity-building in the field of marine scientific research in the deep ocean.

A king crab perched on the jaw bone of a whale skeleton in the deep-sea. Image courtesy of Craig Smith





International Seabed Authority
14/20 Port Royal Street
Kingston, Jamaica
Fax: 1 876 922 0195
E-mail: E-Fund@isa.org.jm

