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Report of the Secretary-General of the International Seabed Authority under article 166, paragraph 4, of the United Nations Convention on the Law of the Sea

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I. Introduction

1. The present report of the Secretary-General of the International Seabed Authority is submitted to the Assembly of the Authority under article 166, paragraph 4, of the 1982 United Nations Convention on the Law of the Sea ("the Convention").

2. The Authority is the organization through which States parties to the Convention, in accordance with Part XI of the Convention, organize and control activities in the Area, particularly with a view to administering the resources of the Area. This is to be done in accordance with the regime for deep seabed mining established in Part XI and other related provisions of the Convention and in the Agreement relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982 (the "1994 Agreement") adopted by the General Assembly of the United Nations under the terms of its resolution 48/263 of 28 July 1994. As provided by resolution 48/263 and the Agreement itself, the provisions of the Agreement and Part XI of the Convention are to be interpreted and applied together as a single instrument. In the event of any inconsistency between the Agreement and Part XI, the provisions of the Agreement prevail.

3. The Authority has a number of additional specific responsibilities under other provisions of the Convention, such as the responsibility to distribute to States parties to the Convention payments or contributions in kind derived from exploitation of the resources of the continental shelf beyond 200 nautical miles pursuant to article 82, paragraph 4, of the Convention, and the responsibility under articles 145 and 209 of the Convention to establish international rules, regulations and procedures to prevent, reduce and control pollution of the marine environment from activities in the Area, and to protect and conserve the natural resources of the Area and prevent damage to the flora and fauna (that is, the biodiversity) of the marine environment.

II. Membership of the Authority

4. In accordance with article 156, paragraph 2, of the Convention, all States parties to the Convention are ipso facto members of the Authority. As at 31 May 2011, there were 162 members of the Authority (161 States and the European Union). On the same date, there were 141 parties to the 1994 Agreement. Since the last session of the Authority, Malawi and Thailand have become parties to the Convention and the Agreement (28 September 2010 and 15 May 2011, respectively), and Angola has become party to the 1994 Agreement (7 September 2010).

5. There are still 21 members of the Authority that became parties to the Convention prior to the adoption of the 1994 Agreement but have not yet become parties to that Agreement, namely: Antigua and Barbuda, Bahrain, Bosnia and Herzegovina, Comoros, Democratic Republic of the Congo, Djibouti, Dominica, Egypt, Gambia, Ghana, Guinea-Bissau, Iraq, Mali, Marshall Islands, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Sao Tome and Principe, Somalia, Sudan and Yemen. Although members of the Authority which are not parties to the 1994 Agreement necessarily participate in the work of the Authority under arrangements based on that Agreement, becoming a party to the Agreement

would remove an incongruity that currently exists for those States. For this reason, each year since 1998, at the request of the Assembly, the Secretary-General has circulated a letter to all members in this position, urging them to consider becoming parties to the 1994 Agreement. In the last such letter, sent in January 2011, attention was drawn to the relevant paragraphs of the report of the Secretary-General for 2010 (ISBA/16/A/2) and to paragraph 3 of General Assembly resolution 65/37 A, calling upon all States to become parties to both the Convention and the Agreement in order to achieve the goal of universal participation in the two instruments. The Secretary-General encourages all those members of the Authority that are not yet parties to the 1994 Agreement to become parties at the earliest possible opportunity.

III. Permanent missions to the Authority

6. As at 30 April 2011, the following 20 States and the European Union maintained permanent missions to the Authority: Argentina, Belgium, Brazil, Cameroon, Chile, China, Cuba, France, Gabon, Germany, Haiti, Italy, Jamaica, Mexico, Nigeria, Republic of Korea, Saint Kitts and Nevis, South Africa, Spain and Trinidad and Tobago.

IV. Protocol on the Privileges and Immunities of the Authority

7. The Protocol on the Privileges and Immunities of the International Seabed Authority entered into force on 31 May 2003. The Protocol, among other things, provides essential protection to representatives of members of the Authority who attend meetings of the Authority or who travel to and from those meetings. It also accords to experts on missions for the Authority such privileges and immunities as are necessary for the independent exercise of their functions during the period of their missions and the time spent on journeys in connection with their missions.

8. As at 30 April 2011, the number of parties to the Protocol was 32, made up as follows: Argentina, Austria, Brazil, Bulgaria, Cameroon, Chile, Croatia, Cuba, Czech Republic, Denmark, Egypt, Estonia, Finland, Germany, India, Ireland, Italy, Jamaica, Mauritius, Mozambique, Netherlands, Nigeria, Norway, Oman, Poland, Portugal, Slovakia, Slovenia, Spain, Trinidad and Tobago, United Kingdom of Great Britain and Northern Ireland and Uruguay.

9. It is a matter of some concern that, with the exception of Ireland, which acceded to the Protocol on 9 February 2011, there have been no other new ratifications of or accessions to the Protocol since February 2009. The Secretary-General would like to draw the attention of members of the Authority to operative paragraph 47 of General Assembly resolution 65/37 A, in which the Assembly called upon States that had not done so to consider ratifying or acceding to the Protocol.

V. Previous session of the Authority

10. The sixteenth session of the Authority was held in Kingston from 26 April to 7 May 2010. Jesus Silva-Fernandez (Spain) was elected President of the Assembly for the sixteenth session, and Syamal Kanti Das (India) was elected President of the Council.

11. The Assembly adopted the administrative budget of the Authority for the financial period 2011-2012 in the amount of $13,014,700. The Assembly also authorized the Secretary-General to establish the scale of assessments for 2011 and 2012 based on the scale used for the regular budget of the United Nations for 2010, taking into account that the maximum assessment rate will be 22 per cent and the minimum rate 0.01 per cent. It was decided that the assessed contribution of Japan would be adjusted to 16.587 per cent. The Assembly, acting on the recommendation of the Council, approved a set of Regulations on prospecting and exploration for polymetallic sulphides in the Area (ISBA/16/A/12) ("the Sulphides Regulations") and also adopted some revisions to the Staff Regulations of the Authority which had become necessary as a result of changes made to the system for administration of justice within the United Nations common system (ISBA/16/A/9).

12. A general debate took place on the annual report of the Secretary-General and the Assembly took note of the proposed substantive work programme of the Authority for 2011 to 2013. Observer status was granted to two organizations; the International Cable Protection Committee and the OSPAR Commission for the Protection of the Marine Environment of the North-East Atlantic ("OSPAR Commission"). The Assembly also took note of memoranda of understanding signed between the Authority and those organizations. As required by the Convention and the 1994 Agreement, the Assembly elected 17 members of the Council for a four-year period commencing on 1 January 2011 (ISBA/16/A/11).

13. The Council continued its consideration of outstanding issues with respect to the draft Sulphides Regulations, specifically issues relating to the proposed anti-monopoly clause and procedures for dealing with overlapping claims. Revisions were agreed to draft regulation 23. On 6 May 2010, in its decision ISBA/16/C/12, the Council adopted the Sulphides Regulations. In the same decision, the Council also adopted special procedures for the resolution of overlapping claims, to have effect for a period of one year following the date of adoption of the Regulations.

14. In response to a proposal originally submitted by the delegation of Nauru, and following much discussion, the Council decided, in accordance with article 191 of the Convention, to request, for the first time, the Seabed Disputes Chamber of the International Tribunal for the Law of the Sea to render an advisory opinion on three legal questions relating to the obligations and responsibilities of States sponsoring activities in the Area, as contained in document ISBA/16/C/13.

15. With respect to the election of members of the Legal and Technical Commission, scheduled for 2011, the Council reaffirmed the streamlined procedure for the nomination of candidates for election to the Commission as agreed at the thirteenth session (ISBA/13/C/6). The Council also agreed that, for the 2011 election, the size of the Commission may be increased, having due regard to economy and efficiency, to up to 25 members, without prejudice to future elections.

VI. Administrative matters

16. There were no changes to the structure of the secretariat during the reporting period. The number of established posts remained at 35 (19 Professional and 16 General Service), with one post at the P-5 level remaining vacant. During the period covered by the report, the posts of Executive Officer (P-5) and Editor (P-3) became vacant following resignations and were filled in April 2011 following a

recruitment exercise. The Authority follows, mutatis mutandis, the recruitment procedures of the United Nations. In accordance with those procedures, the principle of geographical distribution does not apply to the recruitment of General Service staff. The Authority has nevertheless attempted, albeit with limited success, to recruit General Service staff on as wide a geographical basis as possible.

17. In the light of the amendments to the Staff Regulations adopted by the Assembly in 2010, the Secretary-General in January 2011 promulgated a revised edition of the Staff Rules of the Authority (ST/SGB/2011/01). The Secretary-General also promulgated a set of procedures to ensure the appropriate classification and secure handling of confidential data and information entrusted to or originating from the Authority (ST/SGB/2011/03). The procedures are designed to implement article 168 of the Convention and to give effect to the provisions of the rules, regulations and procedures of the Authority relating to prospecting and exploration in the Area. In particular they establish the basic obligations of staff members with respect to the handling of confidential data and information and also specify the standards and procedures for secure handling of confidential data held electronically. Among other things, the procedures require the establishment of a secure data facility within the secretariat for the storage and analysis of confidential data submitted by contractors and applicants for contracts. The new procedures will be implemented progressively throughout 2011.

18. Owing to civil unrest in the area of West Kingston, the headquarters building was closed from 24 to 27 May 2010. As a result of the disturbance, a limited state of emergency was enacted for the parishes of Kingston and St. Andrew from 23 May 2010 to 22 July 2010. Further disruption to the work of the secretariat took place since the offices were closed from 3 p.m. each day, owing to curfews imposed by the security forces in the downtown area.

19. Since the establishment of the Authority in 1996, the secretariat has occupied the second floor and part of the first floor of the building known as Block 11, which has been designated as the headquarters of the Authority. The terms and conditions upon which the premises are made available to the Authority by the Government of Jamaica are established in a supplementary agreement to the Agreement of 26 August 1999 between the International Seabed Authority and the Government of Jamaica regarding the headquarters of the Authority. Although the part of the building occupied by the secretariat was refurbished in 2000 (at the Authority's expense), the building as a whole is showing signs of age and lack of maintenance. In particular, regular and persistent malfunctioning of the air conditioning system and elevators, both of which are more than 20 years old and obsolete, have caused disruption and inconvenience to the smooth functioning of the secretariat. Discussions are ongoing with the building's owner, the National Land Agency of the Government of Jamaica, regarding a long-term solution to these problems. Pursuant to the Headquarters Agreement, the Jamaica Conference Centre is used for the purposes of the annual meetings of the Authority. Although a limited refurbishment of the Conference Centre was carried out in 2008, including upgrading of the sound and interpretation systems, the building and facilities are also showing signs of age and wear.

VII. Budget and finance

A. Budget

20. The budget for the financial period 2011-2012 was approved by the Assembly at the sixteenth session in the amount of $13,014,700 (ISBA/16/A/10). This represented an increase of 3.9 per cent over the budget for the previous financial period, mainly attributable to increases in the costs of established posts and maintenance of premises. There was no increase in the budget for the substantive work programme of the Authority.

B. Status of contributions

21. In accordance with the Convention and the 1994 Agreement, the administrative expenses of the Authority shall be met by assessed contributions of its members until the Authority has sufficient funds from other sources to meet those expenses. The scale of assessments is based on the scale used for the regular budget of the United Nations, adjusted for differences in membership, with a ceiling assessment rate of 22 per cent and a floor assessment rate of 0.01 per cent. At the sixteenth session, the Assembly approved an adjustment to the scale of assessment for Japan to 16.587 per cent, in conformity with the scale of assessment for Japan's contribution to the budget of the United Nations.

22. As at 31 May 2011, 58.6 per cent of the value of contributions to the 2011 budget due from member States and the European Union had been received from 46 members of the Authority.

23. Contributions outstanding from members for prior periods (1998-2010) totalled $246,256. Notices are regularly sent to members of the Authority reminding them of the arrears. In accordance with article 184 of the Convention and rule 80 of the rules of procedure of the Assembly, a member of the Authority that is in arrears in the payment of its financial contribution shall have no vote if the amount of its arrears equals or exceeds the amount of financial contribution due from it for the preceding two years. As at 31 May 2011, 43 members of the Authority were in arrears for a period of two years or more: Belize, Benin, Plurinational State of Bolivia, Burkina Faso, Cape Verde, Comoros, Congo, Democratic Republic of the Congo, Dominica, Equatorial Guinea, Gabon, Gambia, Grenada, Guinea, Guinea-Bissau, Honduras, Lesotho, Liberia, Malaysia, Maldives, Mauritania, Micronesia (Federated States of), Morocco, Palau, Panama, Paraguay, Philippines, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Solomon Islands, Somalia, Suriname, Togo, Tonga, United Republic of Tanzania, Vanuatu, Zambia and Zimbabwe.

24. Also as at 31 May 2011, the balance of the Working Capital Fund stood at $475,623, against an approved ceiling of $560,000. In this regard, it will be recalled that, at the sixteenth session, the Finance Committee recommended an increase in the level of the Working Capital Fund, to be implemented over the next two financial periods.

C. Voluntary Trust Fund

25. The Voluntary Trust Fund to enhance the participation of members of the Finance Committee and the Legal and Technical Commission from developing countries was established in 2002. Provisional terms and conditions for the use of the Fund were adopted by the Assembly, on the recommendation of the Finance Committee, in 2003 and amended in 2004 (see ISBA/9/A/9, para. 14; and ISBA/9/A/5-ISBA/9/C/5). The Fund is made up of voluntary contributions from members of the Authority and others. Over the life of the Fund, voluntary contributions from members of the Authority totalling $178,318 have been received into the Fund. The total amount paid out of the Fund to date is $305,649, which includes advances made from the funds held on account of the registered pioneer investors (the balance of which now forms the capital of the Endowment Fund for Marine Scientific Research in the Area). As at April 2011, the balance of the Voluntary Trust Fund stood at $74,321, including accrued interest of $6,652. No additional contributions have been made to the Fund since December 2009. Since the average annual expenditure from the Fund is approximately $50,000, it is expected that the current resources in the Fund will be substantially depleted following the seventeenth session. Therefore, unless further voluntary contributions are made, it is anticipated that very little, if any, funding will be available to support participation in the eighteenth session in 2012.

VIII. Endowment Fund for Marine Scientific Research in the Area

26. The International Seabed Authority Endowment Fund for Marine Scientific Research in the Area was established by the Assembly in resolution ISBA/12/A/11 of 16 August 2006. The Endowment Fund aims to promote and encourage the conduct of marine scientific research in the Area for the benefit of mankind as a whole, in particular by supporting the participation of qualified scientists and technical personnel from developing countries in marine scientific research programmes, including through training, technical assistance and scientific cooperation programmes.

27. In 2007, the Assembly, on the recommendation of the Finance Committee, adopted detailed rules and procedures for the administration and utilization of the Endowment Fund (ISBA/13/A/6). These rules and procedures provide comprehensive guidance on making applications for assistance from the Fund, the information that must be submitted, the type of activities that are eligible for funding, and the dissemination and reporting of the outcomes of marine scientific research programmes and scientific cooperation programmes. Applications for assistance from the Fund may be made by any developing country or by any other country if the purpose of the grant is to benefit scientists from developing countries. Pursuant to the agreed procedures, an advisory panel was appointed by the Secretary-General in March 2008 to evaluate applications for assistance from the Fund. The Panel is composed of permanent representatives to the Authority, representatives of educational institutions or international organizations and individuals closely associated with the work of the Authority. The members of the Panel, who serve for a period of three years, are appointed with due regard to equitable geographic representation. New appointments will be made to the Panel in 2011.

28. In accordance with the resolution of the Assembly, the initial capital of the Endowment Fund, amounting to $2,631,803, was derived from application fees paid under resolution II of the Third United Nations Conference on the Law of the Sea by seven former registered pioneer investors that have since entered into contracts with the Authority. Additional contributions to the Fund may be made by the Authority, members of the Authority, other States, relevant international organizations, academic, scientific and technical institutions, philanthropic organizations and private persons. Since its establishment, additional contributions to the Fund have been made by the Governments of Germany ($250,000), Mexico ($2,500), Norway ($250,000), Spain ($25,514) and the United Kingdom ($45,053). By the end of December 2010, the capital of the Fund stood at $3,254,538. Over the life of the Fund to date, total accumulated interest amounts to $386,588 of which $275,614 has been disbursed. As at 31 December 2010, in accordance with the financial rules of the Fund, $22,949 was returned to capital, leaving the sum of $88,025 available for disbursement in 2011. At present, the Fund's capital is not actively managed to generate income. Prevailing low rates of bank interest mean that comparatively little additional income can be expected in 2011 and 2012.

29. The Endowment Fund is administered by the secretariat of the Authority, which is required to endeavour to make arrangements with universities, scientific institutions, contractors and other entities for opportunities for scientists from developing countries to participate in marine scientific research activities. Such arrangements may include the reduction or waiver of fees for training. The secretariat has carried out a number of activities designed to draw the attention of the international donor community to the opportunities offered by the Fund and to encourage additional contributions. These activities include issuing press releases and promotional materials, maintaining a specially designed page on the Authority's website at http://www.isa.org.jm/en/efund, and establishing a network of cooperating institutions that may be interested in offering places on courses or research opportunities. Members of the network to date include the National Oceanography Centre (United Kingdom); the National Institute of Ocean Technology (India); the French Research Institute for 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, North Carolina (United States of America); and the International Cooperation in Ridge-crest Studies (InterRidge), an international, non-profit organization promoting interdisciplinary studies of oceanic spreading centres.

30. The total amount of $275,614 has been disbursed by the Endowment Fund through seven separate awards for activities that promote capacity-building. A total of 30 scientists from developing countries have been recipients of financial support. The recipients to date are from Argentina, Bangladesh, Brazil, Cameroon, China, Costa Rica, Egypt, Guyana, India, Indonesia, Jamaica, Madagascar, Maldives, Mauritania, Nigeria, Palau, Papua New Guinea, the Philippines, Sierra Leone, South Africa, Sri Lanka, Suriname, Thailand, Trinidad and Tobago and Viet Nam. Each of the recipients has been able to participate in international training programmes or in research projects, which would not have been possible without the assistance of the Fund.

31. Details of the projects that had been funded prior to 2010 are listed in the report of the Secretary-General for 2010. Since the sixteenth session, three further

awards have been made from the Fund. An award of $19,600 was made to the National Institute of Oceanography, Goa, India, towards the second Technical Assistance Programme-Marine Scientific Research (TAP-MAR II). This enabled a further four scientists from developing countries, Waheibah Daniels (South Africa), Suzan Gharapaway (Egypt), William Saleu (Papua New Guinea) and Schery Umanzor (Costa Rica), to gain new skills and carry out individual, supervised research projects at the Institute. During the training programme, the participants were acquainted with topics related to the exploration of deep seabed minerals, resource evaluation, marine ecosystems and biodiversity-inclusive environmental impact assessment of offshore projects. They were also given hands-on experience with live projects in relevant areas and training in laboratory and field techniques through visits to sites of marine significance. It is hoped that as a result of this training, research programmes between the trainees, their institutions, and the National Institute of Oceanography will be developed that enable additional and ongoing capacity-building.

32. Two awards of $25,146 (2010) and $30,000 (2011) were made to the Rhodes Academy of Oceans Law and Policy to help fund a number of fellowships for students from developing countries and to expand the Academy's training programme to cover issues relating to deep seabed 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 Center for Oceans Law and Policy of the University of Virginia, Charlottesville, United States of America, the Aegean Institute of the Law of the Sea and Maritime Law (Rhodes, Greece), the Law of the Sea Institute of Iceland (Reykjavik), 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. A total of 10 participants benefited from the support of the Endowment Fund in 2010. A further seven students will be supported in 2011.

33. In addition, it will be recalled that an award was made to InterRidge in 2008 for the funding of six marine science fellowships for graduate or postdoctoral students from developing countries during the period 2009 to 2011. Three fellowships had been awarded up to the end of 2010, leaving three fellowships available in 2011. A call for proposals was made in January 2011 and it is expected that the successful candidates will be announced in June 2011.

34. The secretariat of the Authority will continue to take steps to generate interest in the Endowment Fund on the part of potential donors and institutional partners. In this regard, it is noted that in paragraph 11 of its resolution 64/71, the General Assembly called upon "States and international financial institutions, including through bilateral, regional and global cooperation programmes and technical partnerships, to continue to strengthen capacity-building activities, in particular in developing countries, in the field of marine scientific research by, inter alia, training personnel to develop and enhance relevant expertise, providing the necessary equipment, facilities and vessels and transferring environmentally sound technologies". The Endowment Fund is one of the key mechanisms for enabling capacity-building in the field of marine scientific research in the deep ocean and the Secretary-General wishes to encourage 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.

IX. Library, publications and website

A. Satya N. Nandan Library

35. The Satya N. Nandan Library serves as the main information resource for the secretariat, and for member States and other individuals and institutions looking for specialist information on seabed resources and legal and political issues relating to the deep sea. The Library manages the Authority's specialized collection of reference and research materials focusing on matters relating to the law of the sea, ocean affairs and deep seabed mining. It serves the needs of members of the Authority, permanent missions and researchers interested in information on the law of the sea and ocean affairs, as well as providing essential reference and research assistance to support the work of the staff of the secretariat. In addition, the library is responsible for the archiving and distribution of the official documents of the Authority and assists with the publications programme.

36. The facilities available in the Satya N. Nandan library include a reading room with access to the collection for reference purposes and computer terminals for e-mail and Internet access. The specialized research capability of the existing collection continues to develop through an acquisitions programme that is aimed at building upon and strengthening the Library's comprehensive collection of reference materials, and to improve access to information through collecting, cataloguing and preserving relevant documents in print and electronic formats, as well as disseminating information through new products and services. A review of new information technologies and electronic resources is currently being conducted with a view to implement appropriate products to meet the need of users and to improve the services offered.

37. An inventory was also conducted to assess the collection, identify missing items and books which may need repair or replacement, and to identify inconsistencies between the catalogue record and labelling of items to ensure that items corresponded with that of the catalogue. The inventory also provided an opportunity to rearrange the shelves to minimize overcrowding and prevent damage to the books.

38. During the reporting period, 67 books and CD-ROMs and over 400 journal issues were acquired. Some material is now being acquired in electronic format. A concern has been the spiralling cost of subscriptions to legal and technical journals. Simply maintaining current subscriptions now accounts for 50 per cent of the budget allocated to the library. Although the current interest is still more on acquiring publications in print format, present trends in publishing will necessitate a move towards more acquisitions in electronic format in the future. A number of donations were received from institutions, libraries, and individuals, including from the Division for Ocean Affairs and the Law of the Sea of the Office of Legal Affairs of the United Nations, the International Tribunal for the Law of the Sea, the United Nations Educational and Scientific Organization (UNESCO), the United Nations Environment Programme (UNEP), the Food and Agriculture Organization of the

United Nations, the United Nations Development Programme, the Intergovernmental Oceanographic Commission of UNESCO (IOC), the Center for Oceans Law and Policy, University of Virginia, the China Institute for Marine Affairs, the State Oceanic Administration, Division of Marine Geology, Brazil, and the United States Institute of Peace. Individual donations were received from Ambassador Hasjim Djalal and Dr. Philomene Verlaan. A number of staff members also donated publications, many of these from seminars and workshops they attended.

39. The library receives numerous requests for copies of the publications and documents of the Authority. The library also responds to requests for information and guidance on sources of information on subject areas related to the activities of the Authority, the international law of the sea and deep seabed mining, from institutions, non-governmental organizations, academics, government departments and the general public. Some of the areas for which requests were received included: general information on the current activities and the functions of the Authority; law of the sea conferences; current developments in marine mineral resources, and the work of the Authority; application of the Convention to the Caribbean States especially regarding boundary issues in the region; South-East Asia boundary disputes; Africa and the law of the sea; developments in marine mineral exploration, particularly looking at areas of highest interest for investment; Brazil's involvement with marine minerals research; delimitations; geological structure of the Mexico-Pacific Area; multilateral treaty negotiations, especially related to delimitations; responsibilities and obligations of States sponsoring persons and entities with respect to activities in the Area; protection of the deep sea environment; and contracts for hydrocarbon exploration. Requests were also received from, and library services utilized by, individual researchers, a number of embassies and permanent missions based in Jamaica, and a variety of academic and research institutions, including the World Wildlife Fund (WWF), Germany; *Fairplay Magazine*, United Kingdom; University of Munich, Germany; Universidad del Mar, Mexico; National Environment and Planning Agency of Jamaica; Ministry of Foreign Affairs and Foreign Trade, Jamaica; University of Technology, Engineering Faculty; and the University of the West Indies.

B. Publications

40. The regular publications of the Authority include an annual compendium of selected decisions and documents (published in English, French and Spanish) and a handbook containing details, inter alia, of the membership of the Assembly and the Council, the names and addresses of permanent representatives and the names of the members of the Legal and Technical Commission and the Finance Committee.

41. The secretariat also circulates a quarterly newsletter designed to keep member States and other stakeholders informed of new initiatives and current developments with respect to the Authority's programme of work. The newsletter is available via an electronic mailing list or may be downloaded from the Authority's website. So far, more than 150 individuals have subscribed to the mailing list.

42. The Authority publishes the proceedings of its workshops and a range of specialized legal and technical reports. During the past year, the following reports and technical studies have been published:

(a) *Technical Study No. 5*: Non-Living Resources of the Continental Shelf Beyond 200 Nautical Miles: Speculations on the Implementation of Article 82 of the United Nations Convention on the Law of the Sea;

(b) *Technical Study No. 6*: A Geological Model of Polymetallic Nodule Deposits in the Clarion-Clipperton Fracture Zone;

(c) *Technical Study No. 7*: Marine Benthic Nematode Molecular Protocol Handbook (Nematode Barcoding);

(d) *Technical Study No. 8*: Fauna of Cobalt-rich Ferromanganese Crust Seamounts;

(e) *Technical Study No. 9*: Environmental Management of Deep-Sea Chemosynthetic Ecosystems: Justification of and Considerations for a Spatially-Based Approach.

C. Website

43. The Authority's website contains essential information on the activities of the Authority, primarily in English, French and Spanish. The texts of all the official documents and decisions of the organs of the Authority are available in the six official languages of the Authority. Press releases are available in English and French. The website also hosts electronic copies of workshop proceedings, technical studies and other publications published by the Authority and provides users with access to specialized databases, such as the Central Data Repository, a bibliographical database and the library catalogue, as well as an Internet-based geographical information system that allows the interactive production of some maps.

X. Advisory opinion on the responsibilities and obligations of States sponsoring persons and entities with respect to activities in the Area

44. During the sixteenth session of the Authority, the Council decided, in accordance with article 191 of the Convention, to request the Seabed Disputes Chamber of the International Tribunal for the Law of the Sea to render an advisory opinion on the following three questions:

(a) What are the legal responsibilities and obligations of States Parties to the Convention with respect to the sponsorship of activities in the Area in accordance with the Convention, in particular Part XI, and the 1994 Agreement relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982?

(b) What is the extent of liability of a State Party for any failure to comply with the provisions of the Convention, in particular Part XI, and the 1994 Agreement, by an entity whom it has sponsored under article 153, paragraph 2 (b), of the Convention?

(c) What are the necessary and appropriate measures that a sponsoring State must take in order to fulfil its responsibility under the Convention, in particular article 139 and annex III, and the 1994 Agreement?

45. The request was entered in the list of cases before the Tribunal as Case No. 17: "Responsibilities and obligations of States sponsoring persons and entities with respect to activities in the Area". Subsequently, by order 2010/3 dated 18 May 2010, pursuant to article 133, paragraph 2, of the Rules of the Tribunal, the President of the Seabed Disputes Chamber invited States parties, the Authority and intergovernmental organizations invited to participate as observers in the Assembly of the Authority to present written statements on those questions. In the order, in accordance with article 133, paragraph 4, of the Rules of the Tribunal, the President further decided that oral proceedings would be held and fixed 14 September 2010 as the date for the opening of the hearing. States parties, the Authority and the aforementioned intergovernmental organizations were invited to participate in the hearing and to indicate to the Registrar, not later than 3 September 2010, their intention to make oral statements.

46. Written statements were submitted by the following 12 States parties: Australia, Chile, China, Germany, Mexico, Nauru, the Netherlands, the Philippines, Romania, the Russian Federation, the Republic of Korea and the United Kingdom. Statements were also submitted by the Authority and three international organizations, Interoceanmetal Joint Organization, the International Union for Conservation of Nature (IUCN) and UNEP.

47. Pursuant to Rule 131 of the Rules of the Tribunal, the Chamber held three public sittings in Hamburg, Germany, from 14 to 16 September 2010. Oral statements were presented by nine States parties and three international organizations, in the following order: International Seabed Authority, Germany, the Netherlands, Argentina, Chile, Fiji, Mexico, Nauru, the United Kingdom, the Russian Federation, IOC and IUCN. The entire hearing was broadcast live over the Internet. The Chamber issued its advisory opinion at a public hearing held on 1 February 2011. The full text of the opinion appears on the website of the Tribunal.

48. In order to facilitate a better understanding of the content of the advisory opinion, particularly for those members of the Authority that did not participate in the proceedings before the Chamber, the secretariat convened a half-day seminar at United Nations Headquarters on 7 April 2011, during which four eminent legal experts were invited to comment on various aspects of the advisory opinion. The experts were Frida Maria Armas-Pfirter, Professor of Public International Law at both the Law School of the Austral University and the War School of the Argentine Navy, Buenos Aires; John Norton Moore, Walter L. Brown Professor of Law at the University of Virginia School of Law in the United States, and Director of the University's Center for National Security Law and the Center for Oceans Law and Policy; Haiwen Zhang, Deputy Director-General of the China Institute for Marine Affairs under State Oceanic Administration and Secretary-General of China Society of the Law of the Sea in Beijing; and Cymie Payne, Distinguished Environmental Law Scholar at Lewis and Clark Law School and Director of the Global Commons Project at University of California Berkeley, Center for Law, Energy and the Environment. The seminar was well attended by permanent representatives and legal advisers of permanent missions to the United Nations, as well as senior professional

staff from the United Nations Office of Legal Affairs and the Division for Ocean Affairs and the Law of the Sea.

XI. Overview of the substantive programme of work of the Authority for the period 2011-2013

49. The substantive functions of the Authority derive exclusively from the Convention, particularly Part XI, and the 1994 Agreement. Pending the approval of the first plan of work for exploitation, the Authority is to concentrate on the 11 areas of work listed in paragraph 5 of section 1 of the annex to the 1994 Agreement. In view of the limited resources available to the Authority, the relative priority to be given to each of these areas of work is dependent on the pace of development of commercial interest in deep seabed mining.

50. The work programme for the period 2011-2013 continues to focus primarily on the scientific, technical, legal and policy work necessary to carry out the functions of the Authority under the Convention and the 1994 Agreement. Although many items are interrelated, for ease of reference the work programme is organized thematically around the following major substantive work streams, reflecting the provisions of paragraph 5 of section 1 of the annex to the 1994 Agreement:

(a) Ongoing supervision of contracts for exploration and award of new contracts as necessary;

(b) Progressive development of the regulatory regime for activities in the Area;

(c) Monitoring of trends and developments relating to deep seabed mining activities, including world metal market conditions and metal prices, trends and prospects;

(d) Collection and assessment of data from prospecting and exploration and analysis of the results;

(e) Promotion and encouragement of marine scientific research in the Area;

(f) Database development.

XII. Ongoing supervision of contracts for exploration and award of new contracts as necessary

51. The contractual nature of the relationship between the Authority and those wishing to conduct activities in the Area is fundamental to the legal regime established by Part XI of the Convention and the 1994 Agreement. Annex III to the Convention, which sets out the “Basic Conditions of Prospecting, Exploration and Exploitation”, also forms an integral part of this legal regime, which is to be further elaborated in the rules, regulations and procedures adopted by the Authority. Consequently, the administration and supervision of contracts between the Authority and qualified entities wishing to explore for or exploit deep-sea mineral resources lies at the core of the Authority’s functions.

A. Status of contracts for exploration

52. There are at present eight contractors for exploration for polymetallic nodules in the Area. These are: Yuzhmorgeologiya (Russian Federation); Interoceanmetal Joint Organization (IOM) (Bulgaria, Cuba, Czech Republic, Poland, Russian Federation and Slovakia); the Government of the Republic of Korea; China Ocean Mineral Resources Research and Development Association (COMRA) (China); Deep Ocean Resources Development Ltd. (DORD) (Japan); Ifremer (France); the Government of India; and the Federal Institute for Geosciences and Natural Resources of Germany (BGR). The first six contracts were signed in 2001; the contract with the Government of India was signed in 2002 and the contract with BGR was signed in 2006. Contracts have a fixed duration of 15 years.

53. The rules, regulations and procedures of the Authority contain prescriptive requirements relating to the relationship between the Authority (represented by the Secretary-General) and contractors. These include, inter alia, time-sensitive reporting requirements. In accordance with the terms of their contracts, each contractor is under an obligation to submit an annual activity report. Annual reports are due every year on 31 March. The objective of the reporting requirement is to establish a mechanism whereby the Secretary-General and the Legal and Technical Commission are properly informed of the contractors' activities so as to be able to exercise their functions under the Convention, in particular those relating to the protection of the marine environment from the harmful effects of activities in the Area.

54. The regulations are supplemented by recommendations for guidance issued from time to time by the Legal and Technical Commission. To date, the Commission has issued two sets of recommendations. In 2001, the Commission issued a set of Recommendations for the guidance of the contractors for the assessment of the possible environmental impacts arising from exploration for polymetallic nodules in the Area. These describe the procedures to be followed in the acquisition of environmental baseline data and the monitoring to be performed during and after any activities in the exploration area with potential to cause serious harm to the environment. The recommendations were revised and updated in 2010 to reflect advances in scientific and sampling techniques since 2001 (ISBA/16/LTC/7). In 2009, the Commission issued a set of Recommendations for the guidance of contractors for the reporting of actual and direct exploration expenditures as required by annex 4, section 10, of the Regulations (ISBA/15/LTC/7). The purpose of these recommendations is to provide guidance to contractors in relation to the books, accounts and financial records to be maintained in accordance with the Regulations on Prospecting and Exploration for Polymetallic Nodules in the Area (ISBA/6/A/18, annex) ("the Nodules Regulations"), the identification of internationally accepted accounting principles, the format for the presentation of financial information in the annual report, the definition of the actual and direct costs of exploration, and the form of certification of actual and direct exploration expenditures.

55. Each year, the Legal and Technical Commission reviews and evaluates the annual reports provided by contractors and provides any necessary advice to the Secretary-General. The Secretary-General is then able to take up such matters as may be necessary with the individual contractors. During its review of the annual reports in 2010, the Commission expressed general concerns about the reporting of

financial expenditure by contractors and about the quality of environmental data provided by contractors.

56. With respect to the reporting of actual and direct exploration expenditure, the Commission noted that contractors had only partially followed the 2009 recommendations for guidance. The Commission also noted that there were significant variations in reported financial expenditure among contractors in respect of similar items. Moreover, the Commission expressed its concern that some reported expenditures could not be classified as "actual and direct exploration expenditure" as defined in the Regulations. The Commission therefore recommended that the contractors be requested to provide with their next annual reports a revised historical breakdown of reported expenditure in accordance with the 2009 recommendations. The Commission also requested the secretariat to prepare for the next session a detailed analysis of the reported expenditure by contractors in order to enable the Commission to provide further guidance to the incoming Legal and Technical Commission on the treatment of such expenditure. In accordance with the Commission's request, such an analysis has been completed, with the assistance of a consultant, and will be placed before the Commission for its consideration during the seventeenth session. One of the key recommendations of the report is that financial appraisal for potential investors should form one of the components of future reporting, particularly given that the current exploration contracts are entering their final period.

57. With respect to environmental data, the Commission made the general observation that the environmental and exploration work of the current contractors is progressing at a slow pace. The Commission expressed its concern that there was still a lack of raw data being provided by the contractors in spite of numerous requests from both the Commission and the Secretary-General. In view of the completion in 2010, for most of the contractors, of the second five-year period of the 15-year contract for exploration, the Commission requested the secretariat to prepare a detailed analysis of the environmental work carried out by the contractors to date. Such an analysis has been completed and will also be placed before the Commission for its consideration during the seventeenth session. The analysis shows wide variations in the quantity and quality of environmental data being provided by contractors.

B. Pending applications for contracts for exploration

58. In 2008, the Authority received two new applications for approval of plans of work for exploration for polymetallic nodules in reserved areas within the Clarion-Clipperton zone of the Central Pacific Ocean. These applications were submitted by Nauru Ocean Resources Inc. (sponsored by the Republic of Nauru) and Tonga Offshore Mining Ltd. (sponsored by the Kingdom of Tonga). In accordance with the Nodules Regulations, the applications were considered by the Legal and Technical Commission during the fourteenth session. As the Commission was unable to complete its consideration of these applications during that session, the matter was carried over to the fifteenth session. Prior to the fifteenth session, however, the Commission was informed, in a letter dated 5 May 2009 and addressed to the Legal Counsel of the Authority, that the applicants had requested that consideration of their applications be postponed for a number of reasons that were set out in the letter. The Commission took due note of the request and decided to defer

consideration of this item until further notice. Since the sixteenth session in 2010, both applicants have declared their intention to pursue the applications and have also submitted supplementary material updating their original applications. The Commission will therefore resume consideration of these two applications at the seventeenth session.

59. On 7 May 2010, the Secretary-General received the first application for the approval of a plan of work for exploration for polymetallic sulphides in the Area. The application was submitted by COMRA, sponsored by China, and relates to an area in the vicinity of the South-West Indian Ocean Ridge. A second application for approval of a plan of work for exploration for polymetallic sulphides, relating to an area on the Mid-Atlantic Ridge, was received on 24 December 2010, submitted by the Ministry of Natural Resources and the Environment of the Government of the Russian Federation, and sponsored by the Russian Federation. Both applications will be considered by the Legal and Technical Commission during the seventeenth session.

XIII. Progressive development of the regulatory regime for activities in the Area

60. The Authority has a fundamental role to play in ensuring that an appropriate regulatory regime is established, in accordance with the Convention and the 1994 Agreement, that provides adequate security of tenure for future exploration for and exploitation of the mineral resources of the Area, while ensuring effective protection for the marine environment. The regulatory regime would ultimately be encapsulated in a Mining Code, which would comprise the whole of the comprehensive set of rules, regulations and procedures issued by the Authority to regulate prospecting, exploration and exploitation of marine minerals in the Area.

A. Prospecting and exploration

61. The Mining Code so far comprises the Nodules Regulations and the Sulphides Regulations. In addition to specifying the process through which contracts may be applied for and granted, the Regulations set out the standard terms and conditions, applicable to all entities, of contracts with the Authority. The Council is presently in the process of elaborating rules, regulations and procedures governing prospecting and exploration for cobalt-rich ferromanganese crusts in the Area.

62. Draft regulations on prospecting and exploration for cobalt-rich ferromanganese crusts in the Area were proposed by the Legal and Technical Commission in 2009. In considering the draft regulations during the sixteenth session, the members of the Council exchanged some general comments concerning the issues that the Council would need to discuss in more detail in relation to the draft regulations, including that of the appropriate size and configuration of areas for exploration. The Council also noted that the draft regulations proposed by the Commission would require further revision in order to bring them into alignment with the text of the Sulphides Regulations as adopted by the Council in 2010. As insufficient time was available during the sixteenth session to undertake a detailed examination of the draft regulations, the Council agreed to take this matter up in 2011. In the meantime, the secretariat was requested to provide a revised text of the

draft regulations, taking into account the need to bring the draft regulations into alignment with the Sulphides Regulations. An informal advance text, in English only, of such a draft is available under symbol ISBA/17/C/CRP.1, dated 1 February 2011.

B. Exploitation

63. One of the main problems for potential investors in deep seabed mining is that as yet there are no detailed regulations for the exploitation of the resources of the Area. This makes commercial exploitation of these resources very difficult to contemplate. Pursuant to section 1, paragraph 15, of the annex to the 1994 Agreement, as read with articles 153 and 162(2) (o) (ii) of the Convention, the Council may undertake the elaboration of such rules, regulations and procedures as may be necessary to facilitate the approval of plans of work for exploration or exploitation for seabed minerals any time it deems that such rules are required for the conduct of activities in the Area, or whenever it determines that commercial exploitation is imminent, or at the request of a State whose national intends to apply for approval of a plan of work for exploitation.

64. Although the Assembly considered that it may be premature to develop such regulations immediately, it was noted during the sixteenth session that, as part of the programme of work for the period 2011-2013, the secretariat will commission a preliminary study of some of the issues associated with developing an exploitation code, and will also hold a workshop or seminar to review and discuss the issues raised by such a study. It is proposed to carry out this activity between the final quarter of 2011 and the second quarter of 2012.

65. In response to suggestions by members of the Authority during previous sessions, the secretariat also intends to produce a user's guide to the regulatory regime for deep seabed mining. The guide will be written, as far as possible, in non-technical language so that it is accessible to general users, including prospective applicants for licences, representatives of member States, delegates to the Authority's meetings and staff. The guide will clearly explain the basic features, including the fundamental principles and sources of law on which the system is based, of the system for prospecting, exploration and exploitation with reference to the Convention, the Part XI Agreement and the Regulations and explain in a step-by-step fashion the process for applying for exploration licence, including the differences between the three types of resources for which regulations have been or will be adopted. The guide will also explain the terms and conditions of exploration licences, including provisions relating to environmental protections, and the steps contractors are required to take to comply with such terms and conditions.

C. Protection of the marine environment

66. Under articles 145 and 209 of the Convention, the Authority has the responsibility to establish international rules, regulations and procedures to prevent, reduce and control pollution of the marine environment from activities in the Area, and to protect and conserve the natural resources of the Area and prevent damage to the flora and fauna of the marine environment. Scientific knowledge and understanding of the deep ocean biodiversity associated with the different mineral

types is severely lacking. For this reason, the efforts of the Authority since its establishment have been aimed at obtaining a better understanding of this environment. To protect the biodiversity associated with each of the mineral resource types, the associated biodiversity needs to be identified and the gene flow in the province established, and the distribution in the different ocean provinces where the minerals occur needs to be ascertained. An example of the difficulties faced by the Authority can be illustrated with polymetallic sulphide deposits whose origins are hydrothermal vents. The creation of polymetallic sulphide deposits starts at active vent sites, and over time the deposits grow in size and shift away from the active venting in accordance with the theory of plate tectonics. As the plates on which the deposits are found move further from the axis as a result of more polymetallic sulphides being formed through venting, new areas of venting are established that are closer to the axis. At active vent sites, spectacular biota, much of which is unknown to science, is found. The inactive vents, however, do not contain the same spectacular biota as the active vent sites because the environment there is different. They are therefore of lesser interest to scientists when compared with active vent sites. This means that the Authority has much less data on the biota associated with deposits at inactive vent sites, even though these tend to be much larger than at active vent sites.

67. The role of the Authority in this regard can be considered both complementary to and a critical element of wider global efforts aimed at the protection of marine biodiversity in areas beyond national jurisdiction, including the Area. It will be recalled, for example, that, in 2002, at the World Summit on Sustainable Development, Governments committed to improving ocean conservation and management through actions at all levels, giving due regard to the relevant international instruments. This included a commitment to establish representative networks of marine protected areas, including in areas beyond national jurisdiction, by 2012. Also in 2002, the United Nations General Assembly welcomed the World Summit on Sustainable Development commitments and called upon States and relevant international organizations at all levels urgently to consider ways of integrating and improving, on a scientific basis, the management of risks to vulnerable marine biodiversity within the framework of the Convention, consistent with international law and the principles of integrated ecosystem-based management. These targets were reaffirmed in 2009 (see resolution 63/111) when States were urged to “continue and intensify their efforts, directly and through competent international organizations, to develop and facilitate the use of diverse approaches and tools for conserving and managing vulnerable marine ecosystems, including the possible establishment of marine protected areas”.

68. The current level of understanding of deep-sea ecology is not yet sufficient to allow conclusive risk assessment of the effects of large-scale commercial mining. For this reason, many of the technical workshops and research programmes supported by the Authority have been aimed at obtaining a better understanding of the marine environment from recognized experts in the field. These are described in section XVI below. The results of such workshops and research are provided to the Legal and Technical Commission to assist it in its mandate under articles 165(d), (e) and (h), of the Convention to formulate rules, regulations and procedures for the protection of the marine environment from the harmful effects of seabed mining. In pursuance of this mandate, the Commission has before it a proposal for a regional-scale environmental management plan for the Clarion-Clipperton zone, including

the designation of areas of particular environmental interest, and will also consider in 2011 a set of recommendations aimed at managing chemosynthetic environments in the global ocean through spatial planning. Given the broad reach and exclusive nature of the Authority's jurisdiction over the Area, the Authority also cooperates with other competent organizations, such as the OSPAR Commission, in their efforts to better protect biodiversity in areas beyond national jurisdiction.

D. National laws and regulations relating to deep seabed mining

69. In its advisory opinion on the responsibilities and obligations of States sponsoring persons and entities with respect to activities in the Area (see paras. 44 to 48 above), the Seabed Disputes Chamber of the International Tribunal for the Law of the Sea affirmed, in response to the third question posed by the Council to the Chamber, that the Convention requires the sponsoring State to adopt, within its legal system, laws and regulations and to take administrative measures that have two distinct functions, namely, to ensure compliance by the contractor with its obligations and to exempt the sponsoring State from liability. While the scope and extent of these laws and regulations and administrative measures depends on the legal system of the sponsoring State, they may include the establishment of enforcement mechanisms for active supervision of the activities of the sponsored contractor and for coordination between the activities of the sponsoring State and those of the Authority. Laws and regulations and administrative measures should be in force at all times that a contract with the Authority is in force. The existence of such laws and regulations and administrative measures is not a condition for concluding the contract with the Authority; it is, however, a necessary requirement for carrying out the obligation of due diligence of the sponsoring State and for seeking exemption from liability. Particularly as regards the protection of the marine environment, the laws and regulations and administrative measures of the sponsoring State cannot be less stringent than those adopted by the Authority, or less effective than international rules, regulations and procedures.

70. While the Chamber's opinion clarifies the provisions of the Convention and the 1994 Agreement, it also implies that sponsoring States and potential sponsoring States, including developing States that may wish to participate in deep seabed mining by sponsoring plans of work within reserved areas, will need to give consideration to the adoption of appropriate laws and regulations for this purpose. In this regard, participants in the seminar organized by the secretariat at United Nations Headquarters in April 2011 (see para. 48 above) suggested that the Authority may have an important role to play in the development of model legislation for this purpose, particularly taking into account the desirability of harmonization between different jurisdictions and legal systems.

71. Several States have also highlighted the need for national laws and regulations to govern offshore mineral exploration and development within areas under national jurisdiction. In the South Pacific, for example, the Secretariat for the Pacific Community has noted that, despite the recent surge in commercial interest in offshore mining, specific policy, legislation and regulation are lacking in most jurisdictions, particularly in the small island developing States of the Pacific. In this regard also, article 208 of the Convention requires coastal States to adopt laws and regulations to prevent, reduce and control pollution of the marine environment arising from seabed activities within their jurisdiction. Such laws and regulations

shall be no less effective than international rules, standards and recommended practices and procedures, including those adopted by the Authority. Article 209 goes on to require States to adopt laws and regulations to prevent, reduce and control pollution of the marine environment from activities in the Area undertaken by vessels, installations, structures and other devices flying their flag or of their registry or operating under their authority, as the case may be. Again, such laws and regulations shall be no less effective than international rules, standards and recommended practices and procedures established in accordance with Part XI of the Convention.

72. In response to these concerns, the Pacific Community has developed a regional approach to assist its member countries. In June 2011, a regional project will be launched to develop a legal and fiscal framework for sustainable resource management of deep sea minerals in the Pacific Islands region. The project is supported by the European Union under the Tenth European Development Fund and will be implemented by the Applied Geoscience and Technology Division of the Secretariat of the Pacific Community. The Authority has been invited to participate, together with the UNEP GRID-Arendal Programme, as a member of the steering committee for the project.

E. Implementation of article 82, paragraph 4, of the Convention

73. As noted in paragraph 3 of the present report, one of the specific responsibilities of the Authority under article 82, paragraphs 1 and 4, of the Convention is the responsibility to distribute to States parties to the Convention the payments or contributions in kind derived from exploitation of the non-living resources of the continental shelf extending beyond 200 nautical miles from the baselines of the territorial sea (the “outer continental shelf”).

74. Under article 82 of the Convention, States or individual operators who exploit the non-living resources of the outer continental shelf are required to contribute a proportion of the revenues they generate from such exploitation for the benefit of the international community as a whole. This proportion is defined as 1 per cent of the value or volume of production at the site, rising by 1 per cent annually until it reaches 7 per cent, at which level it remains. Article 82, paragraph 4, gives the Authority responsibility for distributing these revenues “on the basis of equitable sharing criteria, taking into account the interests and needs of developing States, particularly the least developed and the land-locked among them”. As the competent international institution to administer article 82 payments and contributions, it is reasonable to expect that the Authority should anticipate and take steps towards the implementation of this provision.

75. In February 2009, the Authority collaborated with the Royal Institute of International Affairs (Chatham House), United Kingdom, an independent policy research institution, in convening a seminar as a preliminary step in the exploration of issues associated with the implementation of article 82. As part of this work, the Authority commissioned two studies dealing with the legal and policy issues associated with the implementation of article 82, and the technical and resource issues associated with the outer continental shelf, respectively. The two studies commissioned by the Authority were revised in the light of the views of the experts participating in the seminar and have since been issued as *ISA Technical Study No. 4*

(published in December 2009) and *ISA Technical Study No. 5* (published in May 2010).

76. As a follow-up to the 2009 seminar, it had been proposed, as part of the programme of work for the period 2011-2013, to convene an expert group meeting involving representatives of members of the Authority, members of the Legal and Technical Commission and other relevant experts, to consider and help to prepare draft recommendations to the Council and the Assembly on the implementation by the Authority of article 82, paragraph 4, of the Convention. Unfortunately, owing to pressure on time and resources as a result of the advisory proceedings before the Seabed Disputes Chamber, it was not possible to convene such a meeting in 2011. It is hoped that, subject to resources being available, this activity can take place in 2012.

XIV. Monitoring of trends and developments relating to deep seabed mining activities, including world metal market conditions and metal prices, trends and prospects

77. World mineral prices continued to be variable and unsteady throughout 2010, but especially in the opening three quarters of the year. The fourth quarter delivered higher market value. By the end of 2010, nickel prices were still approximately 42 per cent below the highest values experienced in 2007 but were higher than 2008 and 2009 prices. The average per pound price of copper in 2010 reached a record high, but manganese remained slightly lower in value than the high obtained in 2008. The global market value of cobalt is still approximately 50 per cent below the record high value experienced in 2008. It is expected that 2011 will continue to be a time of uncertainty in the mineral marketplace.

A. Activity relating to commercial deep seabed mining

78. In January 2011, the Government of Papua New Guinea granted the world's first deep sea mining lease to Nautilus Minerals Inc. for the development of its Solwara 1 project in the Bismarck Sea. The lease covers an area of approximately 59 square kilometres surrounding Solwara 1, which lies 50 kilometres north of the port of Rabaul. The Solwara 1 deposit has a stated resource of 2.2 million tons of ore, including an indicated resource of 870,000 tons at grades of 6.8 per cent copper and 4.8 g/t gold. Nautilus Minerals intends to mine high-grade copper and gold deposits on the seafloor at depths of approximately 1,600 metres. Production is expected approximately two and a half years after full project sanction. It is planned to produce ore at an annual rate of more than 1.3 million tons, containing approximately 80,000 tons of copper and 150,000-200,000 ounces of gold. Ongoing deep-sea drilling is also expected to lead to expansion of the resource base before the start of production. The mining lease has been granted for an initial 20-year term and the Government has exercised its option to take up to a 30 per cent stake in the project as a joint venture partner. The Government will contribute funds to the project in proportion to its interest, including its share of the exploration and development costs incurred to date.

79. Another company interested in marine mining, Neptune Minerals, restructured its operations in 2010. Although not presently operational, the company maintains an interest in 25 prospecting licences for seafloor massive sulphide deposits on the continental shelves of New Zealand, the Federated States of Micronesia, Papua New Guinea and Vanuatu, covering over 278,000 square kilometres of seafloor. The newest ocean mining company, Dorado Ocean Resources, is a Hong Kong-based company founded in 2010. The company was created by Odyssey Marine Exploration, a shipwreck exploration and recovery company, which leveraged its knowledge of ocean exploration and exploitation technology to enter the marine minerals marketplace. In August 2010, Dorado Ocean Resources commissioned a 100-metre research vessel, *Dorado Discovery*, and outfitted the vessel with the latest in ROVs (remotely operated vehicles) and survey equipment. In the first 100 days of its exploration campaign the company reported having identified high-grade seafloor massive sulphide deposits in the South Pacific around the Solomon Islands and Vanuatu.

B. Developments in ocean technology relevant to seabed mining

80. The undersea technology marketplace continues to mature, especially as the offshore oil and gas industry, for example, continues to move into deeper and deeper water. In particular, the past two decades have seen rapid progress in the development of mature marine technology, particularly ROVs and autonomous underwater vehicles (AUVs) with the capability of operating safely and efficiently at great depths. Development of ROV systems began in the early 1970s and the technology is today considered mature and robust. Many specialized tooling systems have been created to allow for efficacious surface intervention using ROVs in support of ultra-deepwater oil and gas drilling operations. These tools are analogous to the tools that will eventually collect minerals from the seafloor and it can be expected that ROV and AUV technology will find application in exploration for marine minerals. Nautilus Minerals Inc., for example, made extensive use of ROVs for detailed site surveys where basic visual, advanced sub-bottom imagery and rock coring operations were conducted at its exploration tenements off the coast of Papua New Guinea. Nautilus also made use of the mature technology being used by the DeBeers Group for diamond mining off the coast of Namibia and South Africa in developing its proposed mining equipment for seafloor massive sulphides.

81. In 2010 there was a major oil spill in the Gulf of Mexico caused by a series of system failures on board the semi-submersible drill rig Deepwater Horizon. This disaster showed the current state of ROV technology with continuous live video transmission from the wellhead during operations attempting to stop the flow of oil into the ocean. While it did take a considerable amount of time to finally kill the well, the capability of remote technology was highlighted during these operations with advanced robotic operations. The knowledge learned as part of this unfortunate event may prove useful when considering the potential impacts of mineral extraction on the marine environment.

82. Deep-water ROV operations, 4,000 metres of seawater and beyond, are limited to only a few operational groups that are predominantly scientifically focused. Canada, France, Germany, India, Japan, the Russian Federation and the United States all have scientific efforts performed in territorial waters, in addition to research programmes conducted in the Area. In addition, various private enterprises

are currently trying to build the next generation of full-ocean-depth submersible systems. The systems under consideration are a new generation of human occupied vehicle (HOV) which "flies" through the water as opposed to the current and past generation of undersea vehicles that would sink to the desired location and move slowly through the terrain. These new HOV systems are currently operational but only to a limited depth capability.

83. The PP Shirshov Institute in Russia operates the *Mir 1* and *Mir 2* submersibles. These are 6,000-metre rated deep ocean research vehicles that have been in use since 1987. The submersibles gained great fame in their many dives and filming activities for the film *Titanic*. The twin submersibles are three-person vehicles and are classed by the Germanischer Lloyds group in Germany. In 2010 the submersibles completed a three-year research expedition on Lake Baikal in Siberia. The expedition made a total of 178 dives, the deepest of which was to 1,640 metres. Very interesting discoveries were made, most important among them the hard gas-hydrate hills under the sediments at the bottom of the lake. For 2011, the two *Mir* submersibles will be deployed to dive in Lake Geneva, Switzerland. The project will be managed through l'Ecole Polytechnique Fédérale de Lausanne, with researchers from the Universities of Geneva and Neuchâtel. In the spring and summer of 2012, Deep Ocean Expeditions is planning to return to the *Titanic* wreck site with the *Mir* submersibles for the one hundredth anniversary of the shipwreck, which occurred on 14 April 1912.

84. The French research institute, Ifremer, operates Nautile, a deep ocean research submersible rated to a maximum depth of 6,000 metres. The submersible was launched in 1987 and accommodates a cabin for three occupants. The submersible operates from its mother ship, the *Pourquoi Pas?*. In January 2010, Nautile was mobilized on the support ship *Atalante* and performed a short two-dive pre-operational mission before engaging in four missions from March to September 2010. The first three missions took place west of Mexico for geology and biology exploration on the East Pacific Rise as well as in the Guaymas Basin and Gulf of Mexico; the last mission aimed to study the biodiversity and the potential resources in the exclusive economic zone of French Polynesia. During this expedition, Nautile completed a total of 83 dives. A major reparation standby is now necessary and scheduled during the first semester of 2011, which aims to modify and replace some of the titanium frame parts. Included in the scope of work for 2011 is the improvement of the positioning and navigation system (which will use similar components to the Victor ROV and AUV systems) with completion of the original video system replacement with current standard high-definition cameras.

85. At Woods Hole Oceanographic Institution in the United States a programme was formalized in 2010 for the submersible *Alvin* to a phased approach to upgrade its capacity to 6,500 metres. A decision was made by Woods Hole and the National Science Foundation to seek dual certification for the submersible, to include both American Bureau of Shipping and United States Navy certification. This has and will continue to produce a comparative review process of rules and regulations between the Naval Sea Systems Command and American Bureau of Shipping rules, as efforts are made at Woods Hole to seek mutual approval for design changes. As the reconciliation effort continues to match the rule requirements, it is likely that the commercial code will experience significant review to address what is likely to be areas of concern by the United States Navy that have traditionally not been addressed in the American Bureau of Shipping rules.

86. The Japan Agency for Marine-Earth Science and Technology operates the *Shinkai 6500* submersible. This submersible performed 63 dives in 2010 and had accomplished a total of 1,240 dives by the end of 2010. The Agency's primary research focus is on the genesis of submarine hydrothermal deposits and cobalt-rich manganese crusts, as well as for generative systems of methane clean energy source.

87. China has been developing the *Jiaolong 7000* human occupied vehicle (HOV) for many years. *Jiaolong 7000* is a three-person submersible designed to dive to 7,000 metres, equipped with a full suite of scientific sensors in addition to assorted subsystems, including manipulators, cameras, navigation systems, lighting, life support, communications, ballast and structure. In July 2010, this vehicle descended to a depth of 3,759 metres. Operations are planned for 2011 to take the vehicle to its full depth capability, which would make this system the deepest diving HOV currently operational.

88. Advancement in AUV capabilities continues to be one of the most rapidly developing areas of marine technology. There are currently over 50 commercial manufacturers and research groups building more than 120 different AUV platforms. These systems are now fully operational in the commercial marketplace and no longer a laboratory curiosity. Autosub from the National Oceanography Centre, Southampton, United Kingdom, has completed over 270 missions travelling more than 3,500 kilometres. Natural Resources Canada and the Canadian Department of Defence used an *Arctic Explorer* AUV to perform a seafloor survey in 2010. This AUV spent 11 consecutive days under Arctic ice completing more than 1,000 kilometres of mapping to help define the continental shelf under the provisions of article 76 of the Convention. In April 2011, researchers from Woods Hole used an AUV to survey a vast area of the Central Atlantic Ocean, during which they successfully located the remains of Air France flight 447. These examples illustrate the capabilities and the cost-effectiveness of such vehicles for seafloor mapping operations over large areas.

C. Assessment of the economic potential of rare earth elements contained in seafloor mineral deposits

89. Possible shortages in the supply of rare earth elements and other metals considered critical "technology metals" have continued to receive an increasing amount of attention in many countries, especially among the major producers of electronics and emerging technologies such as battery systems, hybrid cars, wind turbines and other renewable energy technologies, which require increasing amounts of these metals. Based on the recommendations of the Authority's workshop on the results of the Geological Model and advice from several experts, the secretariat has conceptualized a market-oriented study to help assess the economic potential of rare earth elements and other trace elements contained in seabed deposits.

90. In the case of rare earth elements, it is expected that in the longer term, new land-based sources will be developed outside of China and related activities are under way, for example in the Mountain Pass mine in California. Given the projected increase in commodity prices and the high investment cost involved in developing and processing deposits on land, the competitiveness of seabed minerals may improve through profitable by-product operations. The objective of the study is to determine whether seabed resources could become an alternative source of these

metals and if trace metals other than the traditional metals of interest potentially represent an additional incentive for seabed mining. The geographic variation of trace metal concentrations in seabed deposits and the variation with water depth is largely understudied and existing geochemical data for the various types of deposits are dispersed among different organizations. Moreover, metallurgical factors, including possible ore processing routes and related costs for extracting such trace metals, remain poorly studied.

91. The technical study is designed as a multidisciplinary effort requiring expertise in geology, geochemistry, mining, metallurgy, mineral economy and quantitative geography. More specifically, the ongoing project aims to (a) determine trace metals of economic interest contained in the various deposit types, (b) assess the monetary value of the ores, taking into account the additional value of trace metals and considering metallurgical cost factors of ore processing and (c) identify geographic areas of interest for the various deposit types.

92. During the first phase of the project in 2010, the secretariat has initially undertaken an in-house analysis of information on trace metal concentrations from the literature, data available from the Central Data Repository and unpublished data from different sources. Based on the ongoing monitoring of the global mineral economy, a dedicated database of trace metal concentrations and market prices has been set up, allowing for an overview assessment of the theoretical maximum value of the ores per metric ton in major mineral provinces. The initial assessment was based on simplified model assumptions and did not take the economic and technical practicability of the metallurgical ore processing and resulting recovery rates for individual metals into account. However, purely based on metal grades and current commodity prices, the preliminary results indicate that rare earth elements and other trace metals may significantly increase the potential return on investment, compared to the existing economic models for the major metals of interest, such as nickel, cobalt, copper and manganese. For example, in the cases of polymetallic nodules in the Clarion-Clipperton zone, the preliminary results indicate that the added value from trace metals in terms of the total metal content is in the order of 60 to 70 per cent of the combined value of the major target metals. The overview analysis results suggest similar values for polymetallic nodules in the Indian Ocean and for cobalt-rich ferromanganese crusts in the central equatorial Pacific Ocean. It has, however, to be stressed that these values represent potential maximum figures, not considering highly complex metallurgical factors and other parameters to be considered in economic feasibility models of seabed mining.

93. Based on these promising indications that are consistent with similar investigations at different research institutions, the secretariat has initiated a second phase of the project, which will also address the technical and economic viability of the extraction of trace metals under investigation with the help of external key expertise. Several economic feasibility studies exist on the potential return on investment from the major target metals, including a recent technical study on the investment and operating costs of the collector equipment for polymetallic nodules. However, to assess the potential return on investment for seabed mining, it is essential to investigate the entire ensemble of economic and technical conditions for main-product and by-product operations, including the recovery rates for individual metals. Multidisciplinary input from experts in their respective fields as well as from national and corporate sources is required, especially with regard to ore-processing routes and more consolidated geochemical analysis data. During the

second phase of the project, different scenarios to recover rare earth elements and other trace metals shall be addressed in more detail, for example as by-products from nickel and copper processing. The secretariat has identified several key experts and additional data sources for relevant deposit types and locations.

94. The final products shall be made available to all stakeholders in 2012 and will include a publication in the *ISA Technical Study* series, the integration of the acquired geochemical data into the public Central Data Repository and a geographical information system (GIS) product, including relevant data and thematic maps of geographic areas of interest.

XV. Collection and assessment of data from prospecting and exploration and analysis of the results

95. In 2003, during an international workshop held at Nadi, Fiji, the Authority launched a project to develop a geological model of polymetallic nodule deposits in the Clarion-Clipperton zone. This project was completed in December 2009, when a final workshop to introduce the results of the model was held in Kingston. Subsequently, the core outputs of the project, namely the geological model and a Prospectors' Guide, were published as *ISA Technical Study No. 6*. The model consists of digital and hard copy maps and tables describing the predicted metal content and abundance of deposits in the Clarion-Clipperton zone. The Prospectors' Guide presents all potential proxy data variables identified as important indicators of metal content and abundance and outlines specific data sets that qualify for use in the model.

96. A new initiative on the collection and analysis of GIS data on the geology of the South Atlantic Ocean is under development. The project is based on a similar project conducted by the Geological Service of Brazil in the western part of the South Atlantic and is designed to assemble, integrate and disseminate all available data on the geology and the mineral resources of the entire South Atlantic Ocean in a single geo-referenced environment with interactive mapping capabilities. The project, which was conceived as a result of needs identified during the Authority's sensitization seminars held in Rio de Janeiro, Brazil, in November 2008 and Abuja, Nigeria, in March 2009, is a collaborative effort drawing on the combined knowledge of countries bordering the South Atlantic Ocean and research institutions from other regions. In particular, the intention is for developing countries of the region to benefit from the transfer of knowledge and technologies used by the Geological Service of Brazil through mechanisms of South-South cooperation. The research activities and the GIS data and mapping product developed by the Geological Service for the western part of the South Atlantic have proved to foster resource exploration on the basis of a better knowledge of deposits and the dissemination of related information.

97. To date, the secretariat has initiated a programme involving a variety of institutions and data contributors which aims in the first instance to accumulate geospatial data from marine scientific research, and then to compile a freely available data and visualization product that supports the exploration and sustainable use of mineral resources both in the Area and in neighbouring areas within national jurisdiction. The programme will also contribute to capacity development with regard to resource exploration and geographic information

management including GIS methods for spatial resource assessment and the development of multipurpose marine cadastres. In 2010, the secretariat identified a significant dataset comprised of geological sampling data, geophysical, bathymetric and other information available from the Research Institute for Geology and Mineral Resources of the World Ocean, of the Russian Federation. The analogue data collected during four scientific cruises undertaken in the 1980s cover a large portion of the study area within a geo-transect between Angola and Brazil. In cooperation with the Russian and the Brazilian partners, these data have been digitized and integrated into the GIS product; the cruise reports have been translated in English and metadata have been created.

98. All resource data and related geographic information accumulated in the course of the project are being integrated into the Central Data Repository and GIS. While the scope of the Central Data Repository is global, the South Atlantic project represents the first effort to populate the databases with high-resolution local- and regional-scale geographic information available from diverse institutions for different parts of the ocean.

99. To date, the project activities have mainly related to data acquisition from diverse sources and the compilation of the final GIS product, which is scheduled for release in 2012. While the acquisition and processing of additional data are ongoing, a capacity-development and outreach programme to address the needs of experts and government agencies in developing countries is currently under development.

XVI. Promotion and encouragement of marine scientific research in the Area

100. Under article 143 of the Convention, the Authority has a general responsibility to promote and encourage the conduct of marine scientific research in the Area and to coordinate and disseminate the results of such research when available. It also has a duty under articles 145 and 209 to ensure effective protection of the marine environment from harmful effects which may arise from activities in the Area. The most immediate and practical way in which the Authority has begun to implement its responsibilities under the Convention and to fulfil its various mandates under paragraph 5 of section 1 of the annex to the 1994 Agreement, particularly under subparagraphs (f) to (j), has been the establishment of a series of expert workshops, seminars and meetings. The Endowment Fund also contributes to the development of capacity to carry out marine scientific research in the Area.

101. A key factor for the Authority is that, although a significant amount of basic and applied research has been done in the past or is still in progress, it is broadly accepted that the current level of knowledge and understanding of deep-sea ecology is not yet sufficient to allow conclusive risk assessment of the effects of large-scale commercial seabed mining, as opposed to exploration. In order to be able in future to manage the impact of mineral development in the Area in such a way as to prevent harmful effects to the marine environment, it will be essential for the Authority to have better knowledge of the state and vulnerability of the marine environment in mineral-bearing provinces. This includes, inter alia, knowledge of baseline conditions in these areas, the natural variability of these baseline conditions and their relationship with impacts related to mining. It is also important that such data are standardized, including taxonomic information.

A. Technical workshops

102. The objective of the technical workshops convened by the Authority is to obtain the views of recognized experts in the protection of the marine environment and other specific subjects under consideration and to obtain the most recent marine scientific research results pertinent to the subject matter. In order to disseminate the results as broadly as possible, the proceedings of the workshops are published in book format and on the Authority's website. The outcomes of these workshops have also been submitted to the Legal and Technical Commission to assist it in its work. Most of the international workshops convened by the Authority to date have covered issues associated with managing the possible impacts of mining on the marine environment. They are increasingly recognized by the international scientific and research community as important and authoritative contributions to the specialized scientific literature on deep seabed mining.

103. In November 2010, the Authority convened an international workshop to develop a regional environmental management plan for the Clarion-Clipperton zone. The workshop was convened in response to a request by the Legal and Technical Commission at the fifteenth session. At that time, the Commission had concluded that to prevent future irreversible damage to the marine environment, and taking into account its mandate under article 165, paragraphs (d), (e) and (h), of the Convention, and regulation 31(2) of the Nodules Regulations, the development of polymetallic nodule resources in the Clarion-Clipperton zone demanded a rational and comprehensive environmental management plan for the region as a whole, based on the best available scientific knowledge. Such a plan should include a clear definition of the conservation objectives for the zone, as well as a comprehensive environmental monitoring programme and the definition of a network of representative areas, based on sound scientific criteria, for environmental purposes. The plan should also be fully consistent with the precautionary principle, but should be flexible in order to allow changes as and when new scientific information is gathered. The Commission had therefore recommended that a workshop be convened in order to obtain the best possible scientific and policy advice on the formulation of an environmental management plan at the regional scale for this area.

104. The workshop was attended by 35 participants including seven members of the Commission, as well as representatives from members of the Authority, contractors, the Census of Marine Life, the OSPAR Commission and WWF. The main product of the workshop was a draft environmental management plan for the Clarion-Clipperton zone. The draft plan addresses all the issues that need to be considered for environmental management, specifically in the zone. It includes a summary of the legal regime associated with the management plan, the locations of a network of proposed areas of potential environmental interest and associated proposals for the management of these areas. The draft plan is also written in such a way as to be consistent with the scientific criteria for the identification of ecologically or biologically significant areas in need of protection in open-ocean waters and deep-sea habitats, and scientific guidance for selecting areas to establish a representative network of marine protected areas, including in open-ocean waters and deep-sea habitats, adopted by the Conference of the Parties to the Convention on Biological Diversity at its ninth session in 2008 (COP decision IX/20, annexes I and II, respectively). It may be recalled that in adopting those criteria, the Conference of the Parties urged the parties and invited other Governments and

relevant international organizations to apply these criteria and to take action to protect such areas. The plan will be considered by the Legal and Technical Commission at the seventeenth session (ISBA/17/LTC/WP.1).

B. Strengthening and coordination of international cooperation in marine scientific research

105. At all of the Authority's workshops, the need for cooperation between scientists and coordination of their efforts has been raised repeatedly; hence the second major element in the Authority's efforts to promote marine scientific research has been to act as a catalyst for international collaboration in projects which will help to manage the impact of deep seabed mining and related activities. Specific recommendations from these workshops have included proposals for:

(a) Collaborative studies on the natural variability of the deep-sea ecosystem, consisting of interdisciplinary variability studies of areas under contract, and unification and standardization of research and development methods;

(b) Cooperative biological research on the typical latitudinal and longitudinal ranges of benthic species, the rate and spatial scales of gene flow and the natural spatial and temporal patterns and scales of benthic community variability;

(c) Taxonomic coordination utilizing recognized experts to assist in the correct identification of animal fauna living on the deep seabed, for the purposes of establishing the geographical ranges of species and thus the likelihood of their extinction by a mining operation;

(d) The creation of databases by the Authority to enable contractors to keep up to date with the environmental data and information collected by other contractors and researchers, and to facilitate the work of the Legal and Technical Commission and the other organs of the Authority;

(e) Collaboration in the development of technology, including data-sharing, participation in tests and joint environmental investigation.

106. The Authority has taken steps to progressively address these recommendations in its substantive programme of work. However, it is clear that much more collaborative work among contractors, marine research organizations and the Authority is required if the international community is to be able to take informed decisions on measures required for better environmental management of the Area.

107. Based on the experience gained from previous collaborations, a number of partnerships have been implemented and others have been identified for future consideration. These include a collaboration with the Global Census of Marine Life on Seamounts (CenSeam) programme to obtain data on seamount biodiversity in the western Pacific Ocean, and a collaboration with the Biogeography of Deep-Water Chemosynthetic Ecosystems (ChEss) programme of the Census of Marine Life to obtain relevant species lists for fauna associated with polymetallic sulphide deposits in the Area.

108. The objective of the arrangement with CenSeam was to obtain new data on seamount biodiversity in the western Pacific Ocean. The area identified as of greatest interest, and where very few seamounts have been sampled, stretches west

from the Hawaiian Islands to the Marianas Trough in a band between approximately 8°N and 24°N. Sampling work took place between 2007 and 2009. The final report from the collaboration will be published in 2011 as *ISA Technical Study No. 8*. The report contains a complete species list of organisms found at the crust and non-crust locations sampled, representative images of each species listed, and full sample data (latitude and longitude, seamount name, depth and other appropriate information). The report also identifies information gaps and makes suggestions on how best to increase the knowledge of communities associated with cobalt-rich crusts and their vulnerability to commercial activity associated with these minerals, including recommendations that may be reflected in future guidance to exploration contractors. An expert workshop was held in Vancouver, Canada, in May 2011 to review the outcomes of the collaboration and to assist the Authority in deciding the direction of environmental study with regard to cobalt-rich crusts. The participants in the workshop noted that there was a lack of biological data available in the area of potential cobalt-rich crust deposits and further research should be encouraged. While the findings and conclusions of the original study were confirmed, the participants were able to come to conclusions regarding additional factors driving ecosystem structure at seamounts. The recommendations of the workshop will be made widely available in due course.

109. The international community is becoming more concerned with the need to protect chemosynthetic ecosystems found at hydrothermal vent sites from human impact. On the basis of a proposal by ChEss, an international workshop took place in Dinard, France, from 31 May to 4 June 2010, with the objective of formulating a general approach for the design of networks of areas for the environmental protection of hydrothermal-vent and cold-seep ecosystems, and to outline research needs to assist the spatially based ecosystem management of human impacts in deep-sea chemosynthetic ecosystems. Thirty-one experts in ocean governance, industry, and marine scientific research from 14 countries participated in the meeting, with the goals of formulating general guidelines for the conservation of vent and seep ecosystems at regional and global scales and outlining research needs to improve plans for the spatial management of vent and seep ecosystems. The report of the workshop sets out the first design principles for the comprehensive management of chemosynthetic environments in the global ocean and serves to introduce chemosynthetic ecosystems into the discourse of systematic marine spatial planning. The Authority was a co-sponsor of the workshop and has published the report of the workshop as *ISA Technical Study No. 9*. The recommendations from the workshop will also be considered by the Legal and Technical Commission at the seventeenth session.

110. The Census of Marine Life, which ended its 10-year cycle in 2010, greatly advanced understanding of the environment, including that of the deep sea, but much remains unknown. As a follow-up initiative, an International Network for Scientific Investigations of Deep-Sea Ecosystems (INDEEP) has been established. The aim of INDEEP is to create a global network of committed scientists, including a substantial proportion of younger generation scientists, with a wide variety of skills to maintain and further develop the international collaborations initiated during the Census of Marine Life. INDEEP will work to address key gaps in knowledge relating to deep-sea ecosystems and provide a framework to bridge the gap between scientists and policymakers. It is expected that this will be a source of new environmental data and collaborations in the years to come. The secretariat

participated in the inaugural meeting of INDEEP, which took place in New Orleans in December 2010.

111. It is recalled that in June 2009, in another type of collaboration, the Secretary-General of the Authority and the Secretary-General of COMRA signed a memorandum of understanding aimed at enhancing future cooperation. As a follow-up to that development, in November 2009 the School of Oceanic and Earth Science of Tongji University, Shanghai, China, which is affiliated with COMRA with regard to research projects for deep seabed activities, offered to provide three to five scholarships for master's and doctorate degree candidates from developing countries in the field of marine sciences. Candidates for these scholarships would be jointly selected by the Authority and Tongji University. The scholarship programme was announced by the Secretary-General during the sixteenth session and applications were open from 8 May 2010 to 31 January 2011. Following a review and shortlisting process, two candidates from Mozambique and one candidate from Madagascar were selected for master's degree programmes and one candidate from Mozambique and one from the Lao People's Democratic Republic were selected for doctoral studies. All five candidates will commence their studies in Shanghai, China, in the fall of 2011.

112. In October 2010, the Authority also became a participant, as a host institution, in the United Nations-The Nippon Foundation of Japan Fellowship Programme for Human Resources Development and Advancement of the Legal Order of the World's Oceans. This means that prospective applicants for fellowships under the Programme would be able to select the Authority as a host institution for the purposes of carrying out their research programmes.

C. Regional sensitization seminars on activities in the Area

113. In March 2011, the Authority held the fifth in its series of regional sensitization seminars on marine minerals and other issues relevant to the work of the Authority. The seminar took place in Kingston and was intended for the benefit of the Caribbean States. There was considerable interest in the seminar from the permanent missions to the Authority, as well as relevant Jamaican institutions. Representatives from Barbados, Guyana and Mexico also attended the seminar.

114. The purpose of the regional sensitization seminars, which have been held since 2007, is to inform government officials, marine policymakers and scientists at national and regional institutions of the work of the Authority, and to promote the participation of scientists from institutions in developing countries in marine scientific research being undertaken in the Area by international research organizations. Typically, the seminars include presentations by experts on the type of minerals to be found in the Area, resource evaluation, the protection and preservation of the marine environment from activities in the Area, and the process and status of the legal regimes established for recovery of seabed minerals, as well as presentations on relevant regional issues with respect to the law of the sea. Previous seminars have been held in Manado, Indonesia (March 2007); Rio de Janeiro, Brazil (November 2008); Abuja, Nigeria (March 2009); Madrid (February 2010) and Kingston (March 2011).

XVII. Database development

115. The secretariat maintains a Central Data Repository, which is comprised of the following core data sets: a sea floor massive sulphides database; a cobalt-rich ferromanganese crusts database; a polymetallic nodules database; a web-based GIS; the library catalogue; a bibliographic database; and a seabed patents database. The value of this programme is that it provides a location where all members of the Authority can have access to all non-proprietary data which have been provided to the Authority. The Central Data Repository is also important as a source of information from which to create a baseline for the purposes of environmental impact assessment. As noted above, the Authority is also acquiring a large amount of data for the South Atlantic Project, particularly from the Russian Federation. The data include processed heat flow data, sediment thickness data (from seismic) and bathymetric data. These data will be incorporated into the Central Data Repository.

XVIII. Concluding remarks

116. Following many years of work by the Legal and Technical Commission and the Council, the Authority should complete in 2011 a comprehensive exploration code covering the three main types of seabed mineral resources — polymetallic nodules, polymetallic sulphides and cobalt-rich ferromanganese crusts. This would mark an important milestone in the evolution of the Authority. At the same time, it is noticeable that private sector interest in the potential for deep seabed mining has increased over the past year as the global economy begins to recover from the recent downturn. This is evidenced by the request by Nauru Ocean Resources Inc. and Tonga Offshore Mining Ltd. to reinstate their applications for plans of work before the Legal and Technical Commission as well as by the number of enquiries by other entities and groups of entities that have been made about possible applications for plans of work for exploration in the Area. In addition, there has been increased interest on the part of deep ocean technology companies in participating in the seminars and workshops organized by the Authority. It remains the case, however, that investments which originate from the private sector will inevitably be guided largely by financial considerations, including the impacts of national taxation, payments to the Authority and debt financing. The responsibility of the Authority in these circumstances is to begin the process to develop fair and equitable policies and regulations for the exploitation of marine minerals.

117. The preparation of material in support of the request for an advisory opinion from the Seabed Disputes Chamber dominated the work of the secretariat during the second half of 2010 and the first part of 2011, drawing on resources that would otherwise have been available for some of the activities originally foreseen in the work programme. Nevertheless, the opinion proved to be a milestone not only in the life of the Authority but also in the law of the sea and provided important clarification of some of the more difficult aspects of the Part XI Agreement. The universal reaction to the opinion, including from academia, members of the Authority, and the seabed mining industry, has been positive, in that it has provided much-needed certainty in the interpretation of the obligations and responsibilities of sponsoring States under the Convention and the Agreement. This is an encouraging sign for the Authority and its member States, because it suggests that the commercial sector is developing confidence in the legal regime for the orderly

development of the resources of the Area that has been put in place over the past 13 years.

118. As the level of interest in commercial seabed mining has increased, the Authority has also been placed under increasing pressure to deliver an appropriate level of environmental protection for the Area; an area beyond national jurisdiction that covers a large part of the surface of the Earth. The Authority is a unique organization, in that it has the power to take necessary measures in accordance with the Convention, at a global scale, to ensure the protection of the marine environment from harmful effects arising from activities in the Area. The measures currently under consideration by the Authority in this regard include proposals for an environmental management plan at the regional scale for the Clarion-Clipperton zone and proposals for the management of chemosynthetic environments in the global ocean. A critical factor in these efforts is the need for better science in order to better understand the deep sea environment, including more data and improved standardization of data, especially relating to taxonomy. At the same time, it is vital that efforts by States and competent organizations to better manage threats to biodiversity on the high seas are coordinated with the efforts being undertaken by the Authority for the Area. While the Area and the high seas are subject to different legal regimes, clearly set out in the Convention and the 1994 Agreement, the two areas are physically interrelated. Cooperation is thus essential in order to ensure that measures taken for the high seas and for the Area are complementary. This is exemplified by the cooperative relationship under development between the Authority and the OSPAR Commission.