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Committee on the Peaceful Uses of Outer Space
Fifty-third session
9-18 June 2010

International cooperation in promoting the use of space-derived geospatial data for sustainable development

Note by the Secretariat

At its fifty first session, in 2008, the Committee requested the Secretariat to prepare a summary of the discussions in 2007 and 2008 on agenda item entitled "International cooperation in promoting the use of space-derived geospatial data for sustainable development", for consideration at its fifty-second session, in 2009, and to include information on activities undertaken within the United Nations system that were directly related to the use of space-derived geospatial information for sustainable development (A/63/20, para. 278).

At its fity-second session, in 2009, the Committee agreed that the delegation of Brazil would hold informal intersessional consultations with all interested members of the Committee to reach consensus on its proposal for a set of draft recommendations. The Committee also agreed that, on the basis of those draft recommendations, the information contained in A/AC.105/2009/CRP.3 and the discussion at that session of the Committee, the Secretariat would prepare a draft report, in the form of a conference room paper, to be submitted to the Committee, at its fifty-third session, in 2010, for its consideration and finalization (A/64/20, para. 303).

The present note by the Secretariat contains the draft report as requested by the Committee. The proposed draft, conclusions and recommendations are presented in Chapter IV.

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Draft Report

International cooperation in promoting the use of space-derived geospatial data for sustainable development

I. Introduction

1. The term geospatial data is defined to describe any data with explicit geographic positioning information. The term space-derived geospatial data refers to geospatial data obtained from space-based platforms. The potential value of such data for use in a wide range of applications had been predicted even prior to the beginning of the space age and was confirmed following the successful launch and operation of first remote sensing satellites. Today, the use of space-derived geospatial data has become essential for a steadily growing number of applications which address issues of sustainable development. This development is in part driven by the improving operational capabilities and by the increasing sophistication of space-based platforms and modern information processing systems which contribute to making space-derived geospatial data more easily accessible.

2. Considering the growing importance of space-derived geospatial data for sustainable development, the Committee on the Peaceful Uses of Outer Space, at its forty-ninth session in 2006, had before it a proposal from the delegation of Brazil to include a new item entitled "International cooperation in promoting the use of space-derived geospatial data for sustainable development", under a multi-year workplan, for the period 2007-2009, on the agenda of the Committee (A/AC.105/2006/CRP.15).

3. The Committee subsequently agreed to include the new item under a workplan, with the understanding that it could be revised as necessary for 2008 and 2009 at the Committee's fiftieth and fifty-first sessions (A61/20, para. 302):

Workplan

2007

- Presentations by member States and observers, regional and international organizations and informal coordination groups on their respective activities related to space-derived geospatial information for sustainable development. These could include the United Nations regional centres for space science and technology education, the Group on Earth Observations (GEO), the Committee on Earth Observation Satellites (CEOS), the United Nations Educational, Scientific and Cultural Organization (UNESCO), the Food and Agriculture Organization (FAO), among others.

2008

- Expert presentations on experiences in the establishment of appropriate national infrastructure for space-derived geospatial data collection, processing and application, including human resource training, technical infrastructure and financial requirements, and institutional arrangements.

2009

- Evaluation of the activities undertaken within the United Nations system that are directly related to the use of space-derived geospatial information for sustainable development and consideration of ways to highlight the links existing among those activities and the means to give them stronger international recognition.
- Drafting of a report containing recommendations on ways and means to foster international cooperation with a view to building up national infrastructure to use space-derived geospatial data.

4. The Committee agreed that any recommendations or conclusions resulting from the workplan would be in accordance with the Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of all States, Taking into Particular Account the Needs of Developing Countries (General Assembly resolution 51/122, annex).

II. Summary of the discussions in the Committee

5. During the discussions in the Committee from 2007 to 2009, the representatives of Argentina, Belgium, Brazil, Canada, Chile, China, Colombia, Greece, Hungary, India, Iran (Islamic Republic of), Japan, Mexico, Nigeria, South Africa, the Syrian Arab Republic and the United States made statements under the item. Statements were also made by the representative of UNESCO, as the Chairman of the United Nations Inter-Agency Meeting on Outer Space Activities at its twenty-seventh session, the representatives of the Office for the Coordination of Humanitarian Affairs (OCHA) and the Office for Outer Space Affairs, on behalf of the United Nations Geographic Information Working Group (UNGIWG), and by the representatives of CEOS and the secretariat of GEO.

6. The Committee heard the following technical presentations under the item:

(a) “Use of space-derived geospatial data for sustainable development” and “Use of geospatial data for sustainable development: the Indian context”, by K. Radhakrishnan (India);

(b) “United Nations Spatial Data Infrastructure (UNSDI): time for partnerships”, by S. Ulgen (OCHA);

(c) “National and international collaboration in geospatial data utilization for sustainable development in Nigeria”, by J. Akinyede (Nigeria);

(d) “Acceleration of the establishment of the Indonesian geospatial data infrastructure”, by A. Santoso (Indonesia);

(e) “Operational use of space-derived geospatial data: the key role of GEOSS”, by the observer for the secretariat of GEO;

(f) “COSMO-SkyMed: potentialities for monitoring and management of the natural environment”, by the representative of Italy.

The Committee noted the following items:

7. The use of timely and high-quality space-derived geospatial data for sustainable development in application areas such as agriculture, deforestation assessment, disaster monitoring, drought relief and land management can yield significant societal benefits.

8. National spatial data infrastructures and related national geo-information policies have been established in several member States. A number of national, regional and global initiatives, including activities under the framework of GEO, are addressing issues related to the use of space-derived geospatial data for sustainable development. In particular, the Committee noted the following initiatives:

(a) The Working Group on Information Systems and Services (WGISS) of CEOS is contributing to efforts to enhance international collaboration and to advocate and promote technologies that enable the search of and access to the data and services needed to support scientists, application providers and decision makers.

(b) The Global Spatial Data Infrastructure (GSDI) Association is the umbrella organization through which the international community is sharing experience in the development of spatial data infrastructure. Its small grants programme has directly benefited many African countries.

(c) The Mesoamerican Regional Visualization and Monitoring System (SERVIR), based in Panama City, is providing support to monitoring the environment, improving land use and agricultural practices and assisting local officials in responding faster to natural disasters. Following the success of the SERVIR project in Central America, an African node is being established in Nairobi.

9. A number of organizations at the regional and global levels, such as CEOS (through its Working Group on Information Systems and Services), the European Umbrella Organisation for Geographic Information, GEO and the Global Spatial Data Infrastructure Association, contribute to capacity-building and to the coordination and promotion of activities related to the use of space-derived geospatial data.

10. Global open data access policies provide access to geospatial data either free of charge or at a nominal cost. For example, the United States Geological Survey (USGS) provides the international community, free of charge, with electronic access to all Landsat scenes held in the USGS-managed national archive of global scenes dating back to Landsat-1, launched in 1972. Since February 2009, any archive scene selected by a user is automatically processed to make it a standard product and prepared for electronic retrieval. There are several other ongoing or planned satellite missions which plan to disseminate their data sets in accordance with open data access policies.

11. GEONETCast, a near real-time, near-global, satellite-based environmental information delivery system, developed within the framework of GEO, has significant potential to address bottlenecks in data dissemination. Through the use of low-cost receiving stations it can enhance access to a wide range of information

and reach users in developing countries with limited or no access to high-speed Internet connections.

12. The activities being carried out by the United Nations Geographic Information Working Group, currently co-chaired by the Office for Outer Space Affairs and the Economic Commission for Africa, address common geospatial issues in the United Nations system and work towards implementation of the United Nations Spatial Data Infrastructure. National coordination offices established in some Member States continue to cooperate with the United Nations Geographic Information Working Group and that the tenth plenary meeting of the Working Group was held in Bonn, Germany, from 19 to 21 October 2009.

13. While the benefits of space-derived geospatial data are widely known, there is still a need to enhance capacity-building in many countries to ensure that geospatial data can be exploited to the fullest extent possible. Several member States and non-governmental organizations are contributing to such capacity-building activities.

Some delegations expressed the following view:

14. It is of paramount importance for developing countries to develop their own national infrastructure for space-derived geospatial data. Access to reliable space-derived geospatial information can contribute to facilitate and promote greater transparency and accountability in Government business and enhance information communication and sustainable development.

The following views were also expressed:

15. The extraction of useful information from images still has much potential for improvement. The capacity to build sophisticated Earth observation satellites is not matched by the means to extract useful information from those data sources. Spatial data are therefore not yet exploited to the fullest extent possible.

16. Open data access policies and open source software represent the best approach to combine the efforts of developed and developing countries to promote the use of space-derived geospatial data for sustainable development. Remote sensing data are a public good and the sharing of data should be promoted as openly as possible, on a non-discriminatory basis and on reasonable cost terms.

17. Global open data access policies could be implemented through a global consortium of land imaging satellites, which would provide data access to a constellation of satellites free of charge to all countries. There are existing satellite programmes with data policies that can act as examples for such a consortium; however there is a need for a global forum, such as the Committee, in which the issues can be discussed on an equitable basis. The role of the Committee should not be limited to data policies, but should also address capacity-building in the use of space-derived geospatial data.

18.Open-source software to address the information needs of developing countries is of key importance for bridging the digital divide.

19. In order to avoid duplication of efforts, the Committee, within its current mandate, will have to take into account the activities of existing organizations, as well as ongoing activities in the field of international cooperation in the use of

geospatial data. Numerous examples of ongoing bilateral, regional and international cooperation initiatives in that field have been noted by the Committee, many of which have been fruitful and are promoting the increased use of geospatial data. The Committee will have to take into consideration the balance between commitments for the provision of open access to data and the foreign policy, national sovereignty and security interests of countries.

20. Easy access to space-derived geospatial data and the development of the required information and communications technology infrastructure were essential for making optimal use of geospatial data for sustainable development. However, the development of national spatial data infrastructure was often neglected in developing countries owing to many other, competing needs and the lack of sufficient resources. To address that issue, United Nations entities and other development partners should make the development of a spatial data infrastructure by countries a condition for supporting project implementation, or else collaborate in building national spatial data infrastructures.

21. Although considerable progress was being made in the worldwide development of GEOSS, special efforts were still required to encourage greater participation, especially that of developing countries, in GEOSS. That delegation was of the view that developing countries could derive considerable benefits from using space-derived geospatial data.

22. The concept of data democracy played an important role in promoting the use of space-derived geospatial data for sustainable development. Data democracy included unhindered access to Earth observation information, open-source software and open systems such as freely available image-processing software tools and systems, appropriate dissemination models taking into account the reality of bandwidth availability in developing countries, locally initiated cross-border collaborative projects and intensive capacity-building and training programmes.

III. Activities undertaken by United Nations entities

23. Several United Nations entities are routinely using space-derived geospatial data, which provide a vital source of essential information for a wide range of mandated activities. To facilitate the coordination and exchange of experiences related to the use of space-derived geospatial data, United Nations entities are using the framework of the annual United Nations Inter-Agency Meeting on Outer Space Activities[1] and of the United Nations Geographic Information Working Group (UNGIWG)[2].

24. At its seventh meeting in 2006, UNGIWG endorsed a strategic vision for the implementation of a United Nations Spatial Data Infrastructure (UNSDI)[3], as a comprehensive, decentralized geospatial information framework that facilitates decision-making at various levels by enabling access, retrieval and dissemination of geospatial data and information in a rapid and secure way. This effort is closely coordinated with the United Nations Reform Agenda to ensure that it is

[1] http://www.uncosa.unvienna.org.
[2] http://www.ungiwg.org/.
[3] http://www.ungiwg.org/unsdi.htm.

complimentary with other initiatives geared at enhancing system coherence and harmonization of business practices. National coordination offices for UNSDI have been established by the Czech Republic, Hungary, the Netherlands and Spain.

25. Information on the coordination efforts of United Nations entities related to the use of space-derived geospatial data is also contained in the annual reports of the Secretary-General on the coordination of space-related activities within the United Nations system[4]. United Nations entities are invited to report to the Committee on their relevant activities under the agenda item "Use of space technology in the United Nations system".

26. A half-day informal open session on the theme "The use of space-derived geospatial data for sustainable development in the United Nations system" was held in connection with the United Nations Inter-Agency Meeting on 19 January 2007. Representatives of several United Nations entities provided information on their projects and programmes relevant to the use of space-derived geospatial data. The presentations, available from the website dedicated to the coordination of outer space activities within the United Nations system[5], reflect the extent to which space-derived geospatial data are being used by United Nations organizations.

27. The following paragraphs provide a selection of examples of the activities undertaken by United Nations entities related to the use of space-derived geospatial data.

28. Information derived from space-derived geospatial data is providing essential input for decision making for disaster management and emergency response. The United Nations is obtaining space-derived geospatial data through contractual purchase arrangements with commercial Earth Observation operators as well as in form of in-kind contributions through mechanism such as the International Charter "Space and Major Disasters"[6]. The processing of space-derived geospatial data for maps and other products is partially conducted by experts of United Nations entities, such as in the Department of Field Support (DFS), the United Nations High Commissioner for Refugees (UNHCR), the World Health Organization (WHO), the Office for the Coordination of Humanitarian Affairs (OCHA) and the UNITAR Operational Satellite Applications Programme (UNOSAT)[7]. Processed data and information are then shared among United Nations entities and made available, through websites such as ReliefWeb, a global hub for time-critical humanitarian information on Complex Emergencies and Natural Disasters[8]. The United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER)[9] contributes to capacity-building in the use of space-derived geospatial data in disaster-related situations.

29. United Nations organizations such as the Department of Peacekeeping Operations (DPKO) and DFS are actively developing or participating in international projects to develop valuable large-scale digital geospatial databases

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[4] The latest report in this series has been issued under document number A/AC.105/940.
[5] http://www.uncosa.unvienna.org/uncosa/en/iamos/2007.html.
[6] http://www.disasterscharter.org/.
[7] http://unosat.web.cern.ch/unosat/.
[8] http://www.reliefweb.int.
[9] http://www.unspider.org/.

with the purpose of making available accurate and large-scale topographic map products for operational purposes.

30. The United Nations Environment Programme (UNEP) and the Food and Agriculture Organization (FAO) are extensively using space-derived geospatial data for environmental monitoring, resources management, and biodiversity assessments.

31. The Second Administrative Level Boundaries data set project (SALB), launched in 2001 in the context of the activities of the United Nations Geographic Information Working Group (UNGIWG) is providing access to a working platform for the collection, management, visualization and sharing of sub national data and information in a seamless way from the national to the global level[10]. The project involves the United Nations Economic Commission for Africa (UNECA), the United Nations Economic Commission for Latin America and the Caribbean (UNECLAC), the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), the World Health Organization (WHO), the United Nations Map Library and the Asian Institute for Technology (AIT).

32. WMO, through the space-based component of the WMO Global Observing system[11], in cooperation with the Coordination Group for Meteorological Satellites (CGMS) is coordinating the planning and implementation of satellite missions contributing to the Global Observing System in support of meteorology, climate monitoring, hydrology, and of related applications such as agriculture, aeronautics, maritime transportation and oceanic applications, disaster management, resource and environment monitoring. A number of operational satellite operators and Research and Development space agencies are participating in this global system[12].

33. The Office for Outer Space Affairs, through its United Nations Programme on Space Applications[13], in close cooperation with Member States and relevant international and regional governmental and non-governmental organizations, is contributing to capacity building efforts related to the use of space-derived geospatial data. Specialized courses are held at the Regional Centres for Space Science and Technology Education, affiliated to the United Nations. An education curriculum on remote sensing and geographic information systems has been developed for use in the Regional Centres and in other educational institutions.

34. In the UNGIWG context, significant efforts are being made by the United Nations experts to better coordinate with other relevant international bodies, such as CEOS and GEO, especially in the area of data sharing, open data access policies, and web-based applications to improve the sharing of space-based data and derived geospatial datasets.

35. United Nations organizations have also established or are exploring various partnerships with the private sector and non-profit organizations for better access to space-derived geospatial data. Such partnerships often employ the UNGIWG framework, taking account of transparency and inter-agency coordination and cooperation aspects.

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[10] http://www.unsalb.org/index.php.

[11] http://www.wmo.int/pages/prog/sat/index_en.html.

[12] http://www.wmo.int/pages/prog/sat/CGMS/Satellites.html.

[13] http://www.unoosa.org/oosa/en/sapidx.html.

36. Specific examples include the ongoing partnership with the Google Mapmaker team which allows United Nations entities to access user-contributed geospatial data based on space-derived imagery provided by Google, free-of-charge, or the cooperation with the OpenStreetMaps organization to access and contribute to the expansion of road network data.

37. UNGIWG and several individual United Nations organizations have already established specific operational needs for global core geospatial datasets. They are aware of serious gaps that still exist in the availability of accurate and up-to-date data and are therefore supporting new global initiatives to further improve the availability of such geospatial data, such as through accelerated new data extraction methods making use of space-derived imagery. A specific example is the Global Roads Database project[14], implemented by the Center for International Earth Science Information Network (CIESIN) at Columbia University under the auspices of Committee on Data for Science and Technology (CODATA), a Committee of the International Council for Science (ICSU). The project is using the UNSDI-transportation data model and provides data for one of the most essential core datasets for United Nations purposes.

IV. Conclusions and recommendations on ways and means to foster international cooperation with a view to building up national infrastructures to use geospatial data

38. The discussions in the Committee under the agenda item "International cooperation in promoting the use of space-derived geospatial data for sustainable development" have provided many examples for the critical importance of the use of space-derived geospatial data for a wide range of applications in support of decision-making for sustainable development.

39. The Committee took note of the activities of national, regional, and international inter-governmental and non-governmental organizations relevant to the use of space-derived geospatial data.

40. The Committee addressed a range of issues relevant to the use of space-derived geospatial data, including the sharing of data, data access policies, the use of open source software, the role of data dissemination systems, and the importance of capacity building.

41. The Committee also took note of the activities of several United Nations related to the use of space-derived geospatial data and the coordination of these activities in the framework of the United Nations Inter-Agency Meeting on Outer Space Activities and the United Nations Geographic Information Working Group.

Recommendations

42. States should engage in or continue to support international cooperation initiatives covering the most relevant elements for the creation and operation of national spatial data infrastructures (NSDIs). This includes:

[14] http://www.ciesin.columbia.edu/confluence/display/roads/Global+Roads+Data.

(a) Working towards ensuring the global offer of and access to space-derived data and associated application software, as openly as possible and at the lowest possible cost;

(b) Employing efforts in capacity building, including short-term and long-term training, development of associated infrastructure and institutional arrangements.

43. In addition to the above-mentioned aspects, States should pay particular attention to the creation at the national level of the adequate conditions required for the establishment of NSDIs.

44. In building up national infrastructures to use space-derived geospatial data for sustainable development, States should act in accordance with the Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of all States, Taking into Particular Account the Needs of Developing Countries (General Assembly resolution 51/122).

45. Actions to foster international cooperation with a view to building up national infrastructures to use geospatial data require actions at both the national and international levels, which should be undertaken in accordance with the specific situations of different States:

At the national level:

46. States should identify and categorize their most relevant national environmental and economical issues, as well as define their geospatial data needs for supporting decision and policy-making processes.

47. States should make special efforts to create or expand databases with national geospatial information, which could be supported by the establishment or employment of networks that integrate national research institutions, academia, the private sector and organized civil society.

At the international level:

48. States should make special efforts to engage in or expand international cooperation initiatives that aim at retrieving, classifying and sharing spatial data from remote sensing sources, ground data acquired to facilitate analysis of remotely sensed data, digital maps from specific studies carried out abroad and other relevant data. This could be achieved through the amplification of the networks mentioned above (Recommendation in para. 54).

49. States should make special efforts to develop and disseminate simple tools, with minimal technical requirements and at the lowest cost possible, for the treatment and analysis of geospatial data, as a means to create or enhance autonomous national capabilities to generate information for supporting decision and policy-making processes.

50. States should continue to support the United Nations in its efforts to access and use geospatial information in its mandated programmes to assist all Member States, including through the United Nations Geographic Information Working Group and the United Nations Spatial Data Infrastructure (UNSDI).