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Committee on the Peaceful Uses of Outer Space

International cooperation in the peaceful uses of outer space: activities of international organizations that have contributed to implementing the recommendations of the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space

Note by the Secretariat

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I. Introduction

1. At its forty-sixth session, in 2003, the Committee on the Peaceful Uses of Outer Space reconvened the working group established to prepare a report for submission to the General Assembly at its fifty-ninth session for the review of the progress made in the implementation of the outcome of the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III), in accordance with paragraph 28 of General Assembly resolution 57/116.[1]

2. Also at its forty-sixth session, the Committee took note of the report of the working group,[2] thus agreeing with the working group that the entities of the United Nations system and intergovernmental and non-governmental organizations having permanent observer status with the Committee should be invited to submit reports on their activities and/or initiatives that contributed to implementing the recommendations of UNISPACE III.

3. In a letter dated 23 July 2003, the Office for Outer Space Affairs invited those entities, organizations and agencies to submit their reports by 31 October 2003. The present note was prepared by the Secretariat on the basis of reports received from international organizations in response to that invitation.

II. Replies from international organizations

Committee on Space Research

[Original: English]

1. Space debris

1. The report on space debris of the Committee on Space Research (COSPAR) is included in document A/AC.105/817.

2. Near-Earth objects

2. The public is beginning to realize that impacts of smaller or larger asteroid bodies on Earth are continuous occurrences, as they are elsewhere in the solar system. In designing a rational response to this potential threat, policy and decision makers are hampered by the currently very incomplete state of knowledge of the number, sizes, orbits and physical properties of near-Earth objects, such as asteroids and comets. Equally counterproductive is the almost complete lack of defined governmental responsibilities for addressing the issue of near-Earth objects, even at the national level, and the complete lack of coordination of policies at the international level.

3. Asteroids, by their very nature, may strike anywhere on Earth and recognize no national borders. Although very large impacts causing global ecological disasters are extremely rare, smaller impacts may still cause vast regional destruction, especially in the case of impacts in the oceans. Activities better to characterize the hazard caused by near-Earth objects and place it in a proper context with other, better-known natural disasters should therefore be coordinated at the global level. That work is performed by the international scientific unions, such as the

International Astronomical Union (IAU), COSPAR and the International Council for Science (ICSU), as regards the scientific facets of the issue, hand-in-hand with appropriate intergovernmental organizations, such as the United Nations and the Organisation for Economic Cooperation and Development (OECD), as regards policy issues. Given the different natures of these organizations, the scientific effort is led by IAU, while initiatives in the policy sphere are led by the United Kingdom of Great Britain and Northern Ireland. Close cooperation and coordination is maintained between those initiatives and considerable progress has been made during 2003.

4. A Workshop on Near-Earth Objects: Risks, Policies and Actions was organized by the OECD Global Science Forum in Frascati, Italy, in January 2003, involving scientists engaged in research on near-Earth objects, representatives of international scientific unions and research centres and government officials responsible for national emergency management, foreign policy and international law. An important outcome of the meeting was the growing international recognition that public safety officials needed to consider the issue and to develop jointly appropriate measures for a variety of impact scenarios. It was also concluded that there was a need for further research and development. The aim was not merely better to detect and characterize potentially dangerous near-Earth objects, but also to assess more reliably the consequences of impacts by near-Earth objects of various sizes. The viability and legal aspects of possible measures to minimize the consequences of or even avert an impending impact should also begin to be explored. A follow-up meeting in early 2004, focusing on international policy issues, is under consideration.

5. A full view of the consequences of an impact by a near-Earth object must draw on experience not only from the physical sciences, but also the biological, ecological, nutritional and social sciences. The ideal forum for such international, interdisciplinary studies is ICSU, which unites all the natural sciences and has established links to the social sciences and humanities through the International Human Dimensions Programme on Global Environmental Change, of which the issue of near-Earth objects is one particular aspect. Like floods, deforestation and desertification, the consequences for humanity of a major impact by a near-Earth object will depend also on the reactions of human beings and society itself and these must be taken into account. The recent decision taken by ICSU to fund a major study on that topic in 2004, to be led by IAU and COSPAR, is therefore a most welcome development.

6. Finally, a number of initiatives are under preparation to improve the planning and coordination of activities related to near-Earth objects at the national and regional levels, notably in the United States of America and Europe, most or all of which are led by individuals who are also involved in the initiatives mentioned above. Improved coordination at the national level is therefore to be considered not as competing, but as part of the groundwork needed to establish the joint global-level study programme that all see as the end goal.

3. Scientific capacity-building

7. COSPAR has undertaken the development of a programme of capacity-building workshops in space science and applications. Two of these have now been held and three more are at various stages of preparation. A new COSPAR panel, the

Panel on Capacity-Building, has been established to oversee the programme and to act as a forum for debate on issues related to capacity-building. The Panel is organizing a major session at the forthcoming Scientific Assembly of COSPAR to be held in Paris from 18 to 25 July 2004, with speakers invited from most of the bodies that are active in the field, as well as selected scientists from developing countries. This will reflect and hopefully strengthen the collaboration with ICSU organizations, United Nations entities and space agencies, which is an important COSPAR objective. These activities are described in more detail below.

(a) Objectives of the workshop programme

8. The capacity-building workshops of COSPAR are intended to utilize the very large and advanced archives of space data held by various space agencies. These archives are often freely accessible through the Internet, together with publicly available analysis software. In general, they will have been utilized to a relatively limited extent and they are therefore a vast reservoir of accessible, world-class data. They are, however, used primarily in developed rather than developing countries and the workshop programme aims to correct that situation by providing well-focused and highly practical training courses.

9. Formally, the programme objectives are:

(a) To increase knowledge and the use of public archives of space data in order to both broaden the scope of research programmes in developing countries and ensure that scientists in them are aware of the full range of facilities that are available to them and that are also used by scientists in developed countries;

(b) To provide highly practical instruction in the use of these archives and the associated publicly available software so that participants on returning home can readily incorporate them into their research programmes;

(c) To foster personal links between participants and experienced scientists attending the workshops to contribute to reducing the isolation often experienced by scientists in developing countries.

10. The individual scientists who participate and the scientific and wider communities of which they are a part will be the prime beneficiaries of the programme. However, the value of scientific participation in high-profile space missions for countries that cannot themselves build space hardware should not be underestimated. The data-analysis phase of nearly all space missions is limited in terms of the available human resources, so the missions themselves will also benefit from the increased participation of the scientific community.

11. Furthermore, since the advanced tools required for data analysis for such studies are also becoming increasingly important in many other fields such as engineering, business and finance, one can expect international data analysis projects to have significant spin-off effects for the countries whose young scientists take part.

(b) The workshop programmes

12. The workshop programmes are carefully tailored to contribute to achieving these objectives. The scientific topic is related to one or more major space missions that are currently producing important new results and that also have both

substantial public archives of data and use publicly available processing and analysis software, all easily accessible through the Internet. The topic at one workshop, for example, was X-ray astronomy, based on the Chandra and XMM-Newton X-ray observatories, fully meeting all the criteria.

13. The target participants are final-year postgraduate students, young post-doctoral fellows or faculty members and more senior scientists working in conditions that lead to isolation from the active scientific community. In order for the programme to be organized as effectively as possible, the workshops are usually arranged on a regional basis so that the background of and the problems encountered by participants will have some degree of homogeneity. This also enables some flexibility in deciding on the "target participants" in order to meet local conditions. For example, it may be advantageous to include some final-year undergraduate students in some regions.

14. The computing requirements then require that the workshop be held either in a well-equipped space centre or possibly a university in the region. It is important to demonstrate to participants the feasibility of carrying out practical studies in a developing country environment that is directly relevant to their future work rather than in industrialized countries.

15. The time spent during the workshop is almost equally divided between lectures and practical computing sessions. The lectures cover the cutting-edge science of the missions, the use of the analysis software and also some necessary background in data processing and analysis theory, insofar as this may be specific to the area of science involved. The lectures are tailored to the expected background of the target participant and are closer to graduate student courses than to research seminars.

16. The practical computing sessions commence with setting up the analysis system on the participants' computers, followed by instruction in the initial stages of the data processing. This ensures that when participants return home, they will be able to set up a working system with minimal support. Each participant is encouraged to come up with a proposed project topic. The remainder of the practical sessions is devoted to carrying out the selected project, using archival data. One of the workshop lecturers is assigned to each project as an adviser or supervisor for the duration of the workshop and the links thus forged may endure after it. The final session of the workshop consists of a session at which the outcome of each project is described. The ideal project topic is one that is related to the current research of the participants, on which a useful start can be made during the workshop and which can be the basis for substantial research after returning home.

(c) Workshops held and planned

17. A complete list of past and planned workshops is as follows:

Region	*Host institute*	*Topic*	*Date*
Latin America	National Institute for Space Research, Brazil	X-ray astronomy	December 2001
Asia and the Pacific	Physical Research Laboratory, Centre for Space Science and Technology Education in Asia and the Pacific and Indian Space Research Organization, India	X-ray astronomy	January 2003
	Chinese Academy of Sciences	Magnetospheric physics	May 2004
Southern Africa	University of Natal, South Africa	X-ray astronomy	June/July 2004
North Africa	African Regional Centre for Space Science and Technology—in French Language, Morocco	Oceanography	2005

18. The concept of the workshops as outlined in the previous section was developed and refined at the first two workshops, held in Brazil and India. The number of participants was restricted to between 25 and 30 participants because of practical considerations, mainly the heavy computing and network requirements. Subjective assessments are that both were highly successful. Objective indications are harder to obtain, but in the year after the National Institute for Space Research workshop held in Brazil, guest observer applications from Latin America to the National Aeronautics and Space Administration (NASA) of the United States for new (that is, not archival) observations with Chandra doubled. Participants at the Latin America workshop came from Argentina, Bolivia, Brazil, Chile and Mexico, and those attending the Asia and the Pacific workshop came from China, Taiwan Province of China, India, Republic of Korea and South Africa.

19. The workshops require an important intellectual and financial contribution from the host country. Contributions made by the State of São Paolo Research Foundation and the National Institute for Space Research of Brazil, by the Physical Research Laboratory, the Centre for Space Science and Technology Education in Asia and the Pacific and, especially, by the Indian Space Research Organization of India, are warmly acknowledged. In addition, there have been vital partnerships with ICSU, IAU, the Office for Outer Space Affairs, NASA, the National Science Foundation of the United States and the European Space Agency (ESA), which are described further in paragraph 25.

20. An important and extremely difficult question is that of “embedding” the science of the workshop in the region in which the workshop is held. This requires building bridges to existing scientific institutions, such as the regional centres for space science and technology education, affiliated to the United Nations. However, another possible route is to relate them to major regional scientific projects, such as the Indian X-ray Astronomy Satellite, the Chinese Double Star mission and the Southern African Large Telescope. It is too soon to judge the extent to which such a strategy will be successful.

(d) COSPAR Panel on Capacity-Building

21. At its last Scientific Assembly, held in Houston, United States, from 10 to 19 October 2002, COSPAR set up a new panel to oversee its capacity-building programme. An important aim is to broaden the scientific scope of the programme to the full range of activities that are encompassed by COSPAR and to make the COSPAR community aware of the programme so that proposals for new workshops come from within the community, thus ensuring their relevance to its needs. This has been successful, as three of the workshops shown in paragraph 17 are the result of invitations.

22. The new panel is organizing a major session at the next Scientific Assembly of COSPAR, which is to be held in Paris from 18 to 25 July 2004. The meeting is intended to encourage debate about the objectives of capacity-building programmes in developing countries, identifying perceived needs and successful strategies both from scientists in those countries and from agencies with existing programmes of capacity-building, while recognizing the diversity of needs and the corresponding variety of appropriate strategies among countries at various stages of scientific and technical development. Particular questions to be addressed include (a) the usefulness of targeting different educational levels from schools to scientific research, (b) the particular role that space activities can play and (c) methods of embedding capacity-building in the target communities.

23. The meeting is also expected to contribute to shaping the COSPAR programme of capacity-building workshops and to suggest locations for future workshops.

24. A wide range of bodies active in capacity-building have agreed to take part, as have a substantial number of scientists from developing countries who are active in scientific education. It is hoped this will lead to a useful exchange of ideas, information about programmes and evaluation of successful strategies, leading to better coordination between programmes and informing the plans of COSPAR.

(e) Collaboration with other organizations

25. The severe limitation of funds available to COSPAR or, indeed, to other organizations working in this field makes good collaboration and the coordination of programmes essential. COSPAR attaches great importance to working with a wide range of partners and wishes to acknowledge those who have been, or will be, taking part in the five workshops listed in paragraph 12. These include the African Regional Centre for Space Science and Technology Education—in French Language, the Centre for Space Science and Technology Education in Asia and the Pacific, the Chinese Academy of Sciences, ESA, IAU, ICSU, the Indian Space Research Organization, the International Union of Radio Science, NASA, the National Institute for Space Research of Brazil, the National Research Foundation of South Africa, the National Science Foundation of the United States, the Office for Outer Space Affairs, the Physical Research Laboratory, the State of São Paolo Research Foundation and the University of Natal in South Africa.

4. Promoting awareness of the importance of space activities among decision makers and the general public

26. The actions taken by COSPAR to promote awareness of the importance of space activities among decision makers and the general public are described below.

27. Outreach activities at the COSPAR biennial Scientific Assembly vary depending on the capacities of the local organizers and are generally tailored to the interests of the public and, to a lesser degree, the decision makers of the host country. At the thirty-fourth COSPAR Scientific Assembly, held during the Second World Space Congress, in Houston, United States, from 10 to 19 October 2002, over 10,000 students, educators and young professionals from more than 30 countries participated in a variety of events. The objective was to engage students from every educational level, from kindergarten through graduate school, along with teachers, academics, parents and aerospace professionals. Many of the events will become permanent annual activities in the Houston community. Among the activities are the Houston Science Educator Enrichment Day, a Mars Rover project competition, a student poster session, Make Space for the World's Kids (a space science education festival), Space Rocks! Kids' Festival, a Planetary Society press conference, a global press conference, live interactive web broadcasts for several events, a space generation summit, a workshop on workforce development, an astronomy day at the Houston Museum of Natural Science, two public days at the international trade exhibition and a number of receptions related to some of the aforementioned events. Details of these events can be found at the web site of the World Space Congress (www.aiaa.org/wsc2002).

28. In addition to outreach events, the thirty-fifth COSPAR Scientific Assembly will include a series of panel events to address policy issues and changing conditions that affect the conduct of space science. Speakers at these events, a new element of the COSPAR Assemblies, will include high-level scientists and administrators. The panel discussions will be open to the public and representatives of the media as well as to Assembly participants and COSPAR hopes that they will influence, directly or indirectly, decision makers in the relevant fields. Topics for the panel events planned for the 2004 Assembly include the future of space and international cooperation, space sciences in Europe, the future of humans in space and the role of the International Space Station, highlights from the recent Mars missions and the future of Mars exploration, and the role of space in monitoring global change.

29. At recent Assemblies COSPAR has also organized two events aimed at assisting scientists to understand better how to promote awareness of their work among the public, decision makers and the media. The two events planned for 2004 are:

(a) Space Science Education and Outreach. This session will focus on space science education and outreach from the kindergarten level to the undergraduate level, as well as informal science education provided at museums, science centres and through the Internet. Space science is contributing significantly to science education and this session will allow the community of space science educators to share best practices and research results and to discuss other topics of interest;

(b) The public understanding of space science. This session will complement the special session on space science education and outreach. However, it will focus more on reaching the general public at large rather than the formal space-related education activities at schools, universities and so forth. The session will also encompass media aspects of the subject area and discuss how professional space scientists can maximize the impact of their work on the public perception and influence decision makers and funding agencies.

30. COSPAR is also planning to start a programme with the ESA Student Participation Programme, which would give a number of students the opportunity to participate in future Scientific Assemblies by presenting their own papers, learning about the most up-to-date developments and meeting some of the top researchers in their field. In addition, they would benefit from interaction with like-minded students from across the world. Details are currently under discussion.

Food and Agriculture Organization of the United Nations

[Original: English]

1. Advanced Real-Time Environmental Monitoring Information System

1. The Advanced Real-Time Environmental Monitoring Information System (ARTEMIS) was conceived and developed by the Food and Agriculture Organization of the United Nations (FAO), following the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE-82), in close cooperation with a number of technical partner agencies with substantial donor support. The system, which is now fully part of the regular programme of FAO, was designed to support the environmental information requirements of the FAO Global Information and Early Warning System (GIEWS) on Food and Agriculture and the Desert Locust Information Service. It currently uses inputs from the United States National Oceanic and Atmospheric Administration's advanced very high resolution radiometer, the Système pour l'observation de la terre (SPOT) Vegetation Instrument, the geostationary meteorological satellite and the Terra-moderate-resolution imaging spectroradiometer (MODIS) and, since 1988, routinely generates a number of 10-day, monthly and seasonal information products on vegetation conditions on a global scale, as well as rainfall distribution patterns for Africa and Western Asia. In addition to these products, which are distributed to a variety of users at the global, regional and national levels and which are openly accessible on the Internet at http://metart.fao.org, FAO has developed, with other partners, a suite of image-analysis and graphing software enabling the analysis of ARTEMIS products, including the generation of time series statistics through a web interface.

2. On the basis of the ARTEMIS experience and capacity, FAO assisted the Southern African Development Community (SADC) to establish a similar capacity in Harare, which uses, among others, the ARTEMIS output products as input for generating food security early warning and environmental monitoring value-added information products for the countries of the SADC region. With donor support since 1988, an SADC Regional Remote Sensing Unit has been established, which is widely recognized as a centre of excellence in the region, providing operational satellite-derived information services, technical support and training to the SADC regional and national early warning systems, as well as to a growing number of other users of environmental information.

2. The GeoNetwork initiative

3. The GeoNetwork initiative is the cornerstone of spatial data infrastructure development by FAO. The operational GeoNetwork search interface can be found at www.fao.org/geonetwork.

4. GeoNetwork is a fully operational system for the formulation, management and dissemination of spatial metadata in FAO. In addition, it provides dynamic access to certain datasets through a Web Map Server (WMS) Web-based map server. The expert user can also access GeoNetwork datasets from desktop Geographic Information System (GIS) software and overlay them with local data.

5. During the past year, activities have mainly focused on moving towards a greater degree of standardization, connectivity with other systems and the development of a network of interoperable portals.

6. In May 2003, the GeoNetwork business logic was separated from the graphical user interface (GUI). This allows other agencies to fully customize the application to fit their existing web designs. These components were then released into the open source community and copies of the application can now be downloaded from the web site at http://sourceforge.net/projects/geonetwork.

7. This development allows the realization of one of the central goals of the GeoNetwork initiative, to link together individual data collections in remote locations by means of a common search on all the nodes through the use of a standard search protocol, Z39.50. This concept of a network of integrated portals answers key questions about data sharing and data availability, while preserving existing data ownership and data maintenance arrangements.

8. This activity, which is currently in the operational testing phase, required the development of two components: a search function to query information in remote databases and a server function to provide the information in response to queries. The development of specific thematic profiles, for example, lists of databases mainly dealing with forestry or food security information, may take longer.

9. The search function can send out queries based on the core metadata fields (geographic coverage, title, abstract, keywords and a free text search to explore all metadata fields). This concept therefore relies on the use of standard formats for metadata. Any other metadatabase using the International Organization for Standardization (ISO) 19115 standard and the Open GIS Consortium (OGC) web catalogue services specification can therefore be queried. However, as the search engine also contains a mapping of the Z39.50 protocol's Geospatial Metadata Profile (a list of fields commonly used for identifying spatial datasets), it is able to retrieve information from any database that conforms to that protocol. This includes the data-rich Federal Geographic Data Committee metadata standard-based catalogues and clearinghouses.

10. The server functionality also needs to be compatible with the OGC web catalogue services specification to ensure interoperability and access by remote databases sending in queries.

11. This important tool was developed by the World Food Programme (WFP), based on an architecture developed by FAO as an independent web-based application, and became operational in October 2003. It allows the visual overlay of

datasets from different Internet map services, which do not have to be stored on the same server or in the same location. Therefore, geographical information from different sources, housed in different geographical locations, can be brought together and superimposed to assess the spatial relationships.

12. The application allows the specification of transparency settings for some layers, so that more than one polygon dataset can be viewed. It also includes a basic data selection tool, which allows the user to select servers and then datasets from a preset list. The InterMap viewer has been fully integrated into GeoNetwork so that the existing search and distributed search functionality can be used with it.

13. Some further development of the application itself is also planned for the near future. Style Layer Descriptors will be added for managing legend and layer information. This will allow the user to have the option of changing to a different symbology set.

14. The InterMap viewer will also shortly be released to the open source community as an independent application.

15. In 2002, a proposed minimum field subset for ISO metadata was submitted by FAO to the Third Plenary Meeting of the United Nations Geographic Information Working Group. However, following the release of ISO Implementation Standard 19139, which specifically provides a schema for the definition of profiles within ISO 19115, it is clear that this should be used to redefine a proposed minimum field subset for use by the United Nations family. A new format was recently submitted to the Working Group for approval.

16. One significant input of existing metadata into GeoNetwork is an extensive collection of some 5,000 paper maps, atlases and illustrated reports, held by FAO and managed by an electronic cataloguing system, originally developed in the Integrated Set of Information Systems library format. A mapping of the fields in accordance with ISO 19115 has been undertaken. Initially, the data are likely to be available only for searching within FAO, as the maps cannot normally be removed from the premises. However, there are plans to scan some important items for their electronic dissemination. A radio button to allow users to indicate whether or not they are interested in paper maps will also be added to the GeoNetwork search interface.

3. Dynamic atlas

17. FAO, in the context of a number of field projects, has been working closely for many years with a private entity in Canada on the development of an information management and publishing suite of software called “Dynamic Atlas”.

18. Dynamic Atlas enables the publishing of tabular data, documents and web links through maps on the Internet and on the desktop. It consists of the following products:

(a) “Dynamic Knowledgebase” builds and manages atlases for publishing on the desktop with Dynamic Maps and on the Internet with Dynamic Web Maps Server or Environmental Systems Research Institute ArcIMS. Dynamic Knowledgebase publishes data from Oracle, Structured query language (SQL) Server, Access, Excel, ArcGIS map documents, imagery, shape files, ArcInfo coverages, OGC data sources and others;

(b) “Dynamic Maps” is an end-user tool that provides desktop access to the maps, tabular data and related documents in an atlas. It integrates with Microsoft Office to provide output of maps in PowerPoint and related data analysis in Excel;

(c) “Dynamic Web Maps Server” publishes the atlas on the Internet;

(d) “Dynamic Publisher” enables atlases and Dynamic Maps software to be packaged on a compact disc (CD) for wide distribution to users.

19. Under the auspices of the Land Resources Information Management System for an FAO project in the Libyan Arab Jamahiriya, some major developments of the Dynamic Atlas software are now in preparation. The most significant developments in this migration to version 3 include:

(a) The change from a warehouse database structure to an Atlas-based database structure; data models will be modified to accommodate new features. This will enable Dynamic Maps, the freeware component, to import a local atlas and will overcome the need to use Dynamic Knowledgebase for importing atlases;

(b) The migration of Dynamic Maps, the map server component, from “MapObjects” to “MapObjects Lite”, thus releasing it from commercial licensing requirements;

(c) The development of “Dynamic Web Maps” to become OGC/WMS-compliant, under a separate project financed by the Government of Canada, allowing map services published through Dynamic Web Maps to be accessed by remote servers and overlaid with remote datasets.

4. AgrometShell software

20. The FAO Agrometeorology Group has been involved in crop yield forecasting since the mid-1970s, when severe droughts affected the Western African Sahel. Generic tools have subsequently been developed to assess the impact of weather on crop yields, mostly within the framework of the FAO food security programme. They are characterized by the integration of classical agrometeorological model outputs using ground data, mainly the FAO Water Satisfaction Index and low-resolution satellite information. The ground data and the satellite information are integrated at both the data level (for example, spatial estimation of rainfall) and the product level (for example, use of vegetation indices to estimate district-wide crop yields).

21. The impact assessment methods have recently been integrated into common software, AgrometShell, which provides all the necessary tools to evaluate the effect of weather on crop yields. The AgrometShell maintains full compatibility with WinDisp map and image display and analysis software, the standard tool used in many national agrometeorological services, early warning systems and beyond to visualize and process low-resolution, high-frequency satellite imagery.

5. Standard dataset-building activities

22. The Geocover dataset, which consists of global Landsat multispectral scanner, thematic mapper and enhanced thematic mapper data coverage for the 1975, 1990 and 2000 timeframes, is now available in the public domain via the web site of NASA. FAO is currently cooperating with the University of Maryland Global Land

Cover Facility concerning the transfer of a full copy of the Geocover dataset. This will be used to support the Global Land Cover Network and various regional land cover initiatives, as well as to provide a valuable reference source for a variety of mandated activities of FAO at both headquarters and the field level, such as the Global Forest Resources Assessment and agricultural and food security applications.

23. The 3.6 tetrabytes of data for the three datasets will be registered in GeoNetwork and made available on the Internet in OGC/WMS-compliant format. It will then be able to be accessed directly by multiple users within and outside FAO.

24. The Eastern Africa module of the Land Cover Map and Geodatabase for Africa (AFRICOVER) project covering 10 countries is now complete. The resulting datasets can be viewed interactively at www.africover.org/africover_initiative.htm, which provides detailed information on the methodology used. Aggregated versions of the datasets are available for download to registered users. An important product of the AFRICOVER project is the Land Cover Classification System (LCCS) for interactive characterization of land cover types.

25. LCCS uses a hierarchical series of land cover classifiers to define each class. It has been developed and used as the basis for the AFRICOVER and Afghanistan land cover databases and is now a standard in FAO. It will also be adopted as a standard by the United Nations Environment Programme (UNEP) and FAO hopes that it will be adopted as a standard by more United Nations entities, through the ISO process. Further detail and a downloadable version of LCCS can be found at www.lccs-info.org.

26. The combination of classifiers selected for each class is used to form a unique code that can be attached to GIS polygons. A full, descriptive name for the land cover class is also generated, although the user can also add a local name. Using the codes generated, legends created in geographically diverse areas can be compared or even translated, making LCCS an important tool for assessing existing datasets and maps, not just for creating new ones.

27. A second version, with some adjustments to the way in which mixed classes are handled, is currently in preparation. There are applications that form the link between LCCS, used for initial definition of the legend, and image-processing tools, used for visual interpretation of satellite imagery. These can import an LCCS legend and display it in the corner of the screen; the interpreter has only to click in the appropriate legend class to assign a value to a polygon, which is then transparently shaded. This has eliminated several stages in the previously time-consuming process of digitizing, editing and coding land cover maps, speeding it up considerably and also eliminating several potential sources of error.

28. Following on from AFRICOVER, the Global Land Cover Network is a new FAO/UNEP initiative in the final stages of approval, initially for a period of two years. This would encompass three regional training workshops and database- and capacity-building activities.

29. Related to the Global Land Cover Network initiative is the FAO ASIACOVER project, carried out since February 2003. This covers seven countries (Cambodia, China (Yunnan Province), Lao People's Democratic Republic, Malaysia, Myanmar, Thailand and Viet Nam) and significant efforts have already been made in the mapping of land cover in this region. ASIACOVER is a good example of the use of

LCCS for the comparison and harmonization of legends from various national sources.

30. In addition to ASIACOVER, there are also several regional projects, with proposals at various stages of development. These include projects for the Sahel, SADC and the Gulf Cooperation Council.

31. Various datasets are being created and compiled at the national level. These generally consist of detailed land cover databases prepared using LCCS and various supporting data layers collected together as Dynamic Atlas warehouses.

32. The FAO reference climatic database, FAOCLIM, covers monthly data for 28,800 stations, for up to 14 observed and computed agro-climatic parameters. It includes both long-term averages (mostly from 1961 to 1990) and time series for rainfall and temperature. The data can be accessed by using the following two pieces of software: (a) FAOCLIM proper, to select data by geographical area, time period and parameter and to export them for processing by other software packages; and (b) GeoContext, a user-friendly programme to visualize the information in map and graphic form.

33. The LocClim global climate estimator was developed to provide an estimate of climatic conditions at locations where no observations are available. The programme uses the stations in FAOCLIM. Estimates of monthly, 10-day and daily values of common climate variables are given, together with error estimates, using a number of options to correct for regional variability, altitude dependency and horizontal gradients of the variables.

34. A regional soil and terrain database for eight countries in Southern Africa was prepared. The scale of the maps varies between 1:1,000,000 and 1:2,500,000. This regional database is in addition to a number of other soil and terrain databases already prepared by FAO for Eastern Europe, North and East Africa, North and Central Asia and Latin America and the Caribbean, in cooperation with the International Soil Reference and Information Centre and UNEP. More information can be found at www.fao.org/ag/agl/lwdms.stm.

35. Standardized, consistent global hydrological layers were identified as a high priority through a survey of data gaps and requirements. Within FAO, they are of critical importance to several services and divisions that have come together under the auspices of the Spatial Information Management and Decision Support Tools Priority Area for Interdisciplinary Action, in order to resolve this issue. The services and divisions involved include the Inland Water Resources and Aquaculture Service, the Land and Water Development Division and the Geographic Information Systems Group of the Environment and Natural Resources Service. To date, their efforts have focused on documenting existing datasets and defining the specifications for the datasets required. Significant financial resources will need to be identified before these datasets can be created.

36. One key initiative, which is actively progressing, is the African Water Resources Database, in collaboration with the Water Development Division and the Environment and Natural Resources Service. The development of the database is a work in progress being carried out under the guidance of the Inland Water Resources and Aquaculture Service. It is a GIS-based analytical platform that allows users to visualize and analyse the complex hydrological and ecological relationships

within specific river reaches, larger-scale river basins and entire megabasins. There are over 75 data layers.

37. The database is intended to provide water and natural resource managers with tools that foster the sustainable use of water resources as a means of promoting responsible management of inland aquatic resources and increasing food security. In general, the source scale of these data supports analyses from 1:1,000,000 to 1:5,000,000 for vector data and a nominal resolution of 1 to 5 kilometres for raster data. It includes a surface waterbodies module, a watershed statistics module and an aquatic species module. The first version of the database will be made available in late 2003 as an FAO technical publication and a set of CD-ROM data disks.

38. In cooperation with the Cartographic Section of the United Nations and the Second Administrative Level Boundaries (SALB) project, coordinated by the World Health Organization (WHO), FAO has started to create a version of a standardized international boundaries layer with polygon topology. A beta version of the map is available from FAO.

39. FAO is actively cooperating in the SALB project by providing updated material to the project coordinator on an ad hoc basis as new material is collected through contacts and field offices. It is also assisting with the editing process for some countries. The project is actively using the GeoNetwork ISO standard for its metadata and is making approved maps, of which there are currently 12, available through the network.

40. Under an agreement with the project, FAO receives the edited versions of the project data before they are verified by the national mapping agency. This is important, as the verification process is proving to be very time-consuming, but the datasets are vital for various mapping initiatives and projects in FAO, such as the Nutrition Country Profiles, the Global Subnational Land Use Database and the inter-agency project on improving methods for poverty and food insecurity mapping and its use at the country level.

41. FAO is committed to the use of the SALB data as a standard in its work and is using its in-house Geographic Information Systems Group as a vehicle to promote the importance of such standard datasets. While the need for resources for such a comprehensive effort is acknowledged, it is recognized that SALB is only a first step and if there is demand for more accurate assessments, more and more detailed geographical boundaries will be required.

6. Development of spatial standards

42. FAO has an active in-house working group dedicated to improving coordination and cooperation in the field of Spatial Information Management and Decision Support Tools. Details are available from the FAO web site at www.fao.org/spatl/index_en.asp. This is one of 16 Priority Areas for Interdisciplinary Action established by FAO to ensure interdepartmental coordination on various key cross-cutting issues. The objective is to facilitate access to standardized spatial data and information produced within and outside FAO for use in global and regional perspective studies and for national application by member States.

43. In cooperation with the Priority Area for Interdisciplinary Action on Quality of Information, the main priorities of the Spatial Information Management and Decision Support Tools are to coordinate:

(a) The production of standard maps of various scales, such as base maps of coastlines, rivers and water basins with their international names, and international and administrative boundary maps;

(b) The production of guidelines for the standardization of the use of country and subnational codes;

(c) The production of a manual on GIS databases and products;

(d) The generation of spatial agricultural country information and geo-referenced subnational land-use databases through the FAO web site;

(e) The enhancement of the GeoNetwork corporate spatial data infrastructure with a broad range of services and links with outside partners;

(f) The updating of methodology for land-use surveys and definitions and decision support tools, in particular those relating to land-use planning.

Wherever possible, recommended standards reflect or build on existing internationally recognized protocols, such as ISO standards, OGC specifications and various de facto standards.

7. Disaster response and emergency management

44. Information on the FAO GIEWS on food and agriculture can be found at www.org/giews. Since 1975, GIEWS has been providing regular bulletins on food crop production and markets at the global level and situation reports on a regional and country-by-country basis. GIEWS aims to provide policy makers and policy analysts with the most up-to-date information available on all aspects of the global food supply and demand situation, warning of imminent food shortages and crises, so that timely interventions can be planned between the agencies involved and the donor community. GIEWS is a food security activity, but it also provides information critical to the understanding and mitigation of complex emergencies.

45. Within GIEWS, the core spatial component is provided by GeoWeb (http://geoweb.fao.org), a Web-based application that allows custom access to various databases and information used by FAO GIEWS analysts to assess the crop and food demand and supply situation for all countries in the world. The current version of this application is released for test purposes only, owing to a major redevelopment that is in progress and scheduled for operational release in November 2003.

46. The new version of the GIEWS workstation aims to include several important new features, including an analytical tracking tool, enhancing its interoperability with other FAO information systems and ensuring continued, seamless use of data provided by systems such as ARTEMIS and others. The development of a GeoNetwork link for GIEWS spatial metadata is important in its own right, but it will also provide additional benefits when the ARTEMIS data products are available through GeoNetwork.

47. Another FAO Priority Area for Interdisciplinary Action concerns Disaster Prevention, Mitigation and Preparedness and Post-Emergency Relief and Rehabilitation. Its objectives are:

(a) To develop the capability of FAO as a diversified source of information on technical, institutional and policy considerations of relevance to the theme of this priority area;

(b) To increase synergies between the FAO technical and operational units concerned, so that normative activities reflect lessons learned from field experience;

(c) To increase the effectiveness of FAO in relation to emergency preparedness and response at the field level.

48. The Food Security and Agricultural Projects Analysis Service of FAO is developing its capacity to respond to protracted and complex emergency situations. This capacity is a combination of data gathering (both spatial and non-spatial) and the development of human resources to enhance the analysis capability.

49. In order to support this activity, an emergency information system will be developed to provide access to applicable data (spatial and tabular) that can be used in models to produce relevant information from these data to assist the analysts. As a first step, a report was commissioned to identify which existing databases in FAO would be most useful in an emergency situation and how they might be accessed by, or linked to, a future emergency information system. Some important databases from partner agencies were also considered. SALB, GIEWS, ARTEMIS-GeoNetwork and the Global Subnational Land Use Database were identified as key spatial data sources for the system. Important tabular data are also contained in the FAO statistical, project management and procurement databases.

50. The Food Security and Agricultural Projects Analysis Service is also making use of the Dynamic Atlas suite of tools to compile national-level atlases of relevant information in the form of digital libraries that can be accessed through the Internet. Countries of key concern are currently Afghanistan, Angola, the Democratic Republic of the Congo, Liberia, Sierra Leone, Somalia and the Sudan.

51. The Rapid Agricultural Disaster Assessment Routine (RADAR) is a methodology proposed by the Natural Resources Service to contribute to the rapid assessment of disasters caused by geophysical factors. The information is necessary for optimizing relief operations, mitigating impacts and planning for rehabilitation. RADAR makes use of various input data such as near-real-time remote sensing and ground-based observation, in combination with knowledge-based analysis and physical modelling derived from a detailed geo-referenced database of similar historical events.

8. Distance learning activities

52. The FAO World Agricultural Information Centre Outreach Programme is involved in a major initiative to develop a series of learning tools, called the Information Management Resource Kit, for professionals who, owing to changes in technology, are now becoming involved in the management of digital information. Further details can be found at www.fao.org/waicent/portal/outreach/resourcekit_en.htm.

53. Some of the key concepts and principles that underpin the Information Management Resource Kit are as follows:

(a) It is a distance learning tool, not initially designed for a classroom environment;

(b) It is CD-based for greater accessibility;

(c) It is self-paced and a self-designed learning path can be created by the learner;

(d) Each lesson contains an element of self-testing;

(e) The lessons are authored by subject matter experts, but reviewed by instructional designers;

(f) Materials undergo rigorous review before being released;

(g) In order to ensure relevant agencies are involved in the management of the digital information, partnership agreements are established wherever applicable;

(h) Materials will be grouped into reusable elements wherever possible;

(i) All training materials will be free from reliance on licensed software products, although, where relevant public domain applications exist, these may be included on the CD;

(j) Supporting materials and related existing documents will also be included on the CD to provide more in-depth information for interested learners;

(k) The materials will be presented in a culturally sensitive manner and in the five official FAO languages.

54. Currently, three modules are in preparation. The first, on the management of electronic documents and associated images is in the final stages of the review process and is due for release in the coming months. The other two cover community building: electronic networking and communication, and the role of information in institutional development respectively. The structure and content of these modules are still in the planning phase; an international workshop to review the current drafts is planned for early 2004. The proposed units include the following and each unit would contain between four and seven half-hour lessons:

(a) Overview of spatial data management systems;

(b) Spatial data concepts and models;

(c) Acquiring, creating and linking geo-referenced data;

(d) Data organization and management;

(e) Metadata, metadatabases and interoperability;

(f) Outputs: data presentation, analysis and map production;

(g) Publishing data on the Web;

(h) Integrated dataset management solutions;

(i) Case studies and application projects.

9. Inter-agency activities

(a) Partnership with the World Food Programme

55. Development of the successful partnership initiated in 2001 between the Environment and Natural Resources Service of FAO and the Vulnerability Analysis and Mapping Unit of WFP for the development of GeoNetwork has continued and has led to full interoperability. It has also created synergies and is taking the GeoNetwork initiative forward at a faster pace than would be possible with only one entity involved.

56. Similarly, fruitful discussions have been held with various units in WHO that are committed to using the GeoNetwork technology for their metadata and access to WHO databases, for example, in the context of the SALB project.

(b) Food Insecurity and Vulnerability Information and Mapping Systems

57. In late 2002, the FAO GeoNetwork team initiated a user needs assessment. This initially focused on in-house users, that is, GIS practitioners working with thematic datasets in FAO technical departments. The importance of a standardized, open-access framework for managing spatial data and related metadata within FAO in a consistent fashion was clearly recognized, as were the benefits of being able to utilize the same framework for data dissemination and interoperability with other agencies and partners. However, training in the application of the relatively new ISO 19115 metadata standard was identified as a key requirement and, consequently, training courses were arranged in February and May 2003 for in-house and external users.

58. In collaboration with the secretariat of the Food Insecurity and Vulnerability Information and Mapping Systems (FIVIMS) Programme, hosted by FAO, the user needs assessment was then extended to partner agencies of the FIVIMS Inter-Agency Working Group. These external agencies were asked a different set of questions relating to their perception of GeoNetwork and its potential relevance to their work.

59. There are several strong parallels between the FIVIMS Programme and GeoNetwork. Both aim to improve access to spatial data, FIVIMS at the inter-agency and national levels and GeoNetwork on a technical level via the Internet. Neither is a database-building initiative, rather focusing on the targeted dissemination and distribution of existing data in appropriate standardized formats and promoting interoperability between agencies of the Working Group.

60. Several key FIVIMS Inter-Agency Working Group member entities are also members of the United Nations Geographic Information Working Group, for example, OCHA, WFP, UNEP, FAO, WHO and the Office for the Coordination of Humanitarian Affairs of the United Nations Secretariat, although representation on each body is not necessarily from the same internal department. Other, non-United Nations members of the FIVIMS Inter-Agency Working Group are members of the Consultative Group on International Agricultural Research, the World Bank and the World Resources Institute.

61. Some of the key findings of this second phase of the user needs assessment were as follows:

(a) There are widely differing levels of involvement and expertise in the fields of metadata and clearinghouses between entities and depending on the mandate of the organization;

(b) Users involved in food security have a strong interest in more training and information on GeoNetwork;

(c) The planned distributed search functionality was considered extremely important and necessary to realize the full potential of GeoNetwork;

(d) A core group of six entities expressed a positive interest in using GeoNetwork for managing metadata or becoming a node in a network of integrated portals, or both. The Consultative Group on Agricultural Research is particularly interested in such a goal and has already conducted one training workshop in Sioux Falls, United States, which set out the groundwork for such a network, focused on the sharing of agricultural and related information;

(e) WHO is actively working on converting its existing metadata to the ISO standard. A representative attended the GeoNetwork training workshop and is currently importing this metadata into a WHO GeoNetwork. ISO-standard metadata using GeoNetwork is also actively being generated by WHO for the SALB datasets on a country-by-country basis;

(f) The International Centre for Tropical Agriculture (CIAT) and the Centre for International Forestry Research (CIFOR) have both established metadata catalogues and portals. That of CIFOR can be found at http://gislab.cifor.cgiar.org/fsic and CIAT data can be located through the United States Federal Geographic Data Committee clearinghouse system. Following the successful Workshop on Geospatial Applications to Support Sustainable International Agriculture, held in Sioux Falls, United States, from 19 to 31 May 2002, the centres of the Consultative Group on Agricultural Research are currently looking to develop a network of nodes including the above portals and the povertymap.net site, which is powered by UNEP.Net, a global portal maintained by UNEP to provide authoritative environmental information based on themes and regions.

62. The Earth Resources Observation System (EROS) Data Center of the United States geological survey has also installed and is testing a copy of GeoNetwork. UNEP has expressed its intention of moving towards the standards implemented by GeoNetwork, although discussions have been focused on ensuring interoperability between systems.

63. The Global Terrestrial Observing System aims at improving the quality and coverage of terrestrial ecosystem data. It facilitates access to such information, to allow researchers and policy makers to detect and manage global and regional environmental change. The co-sponsors of the Global Terrestrial Observing System are FAO, UNEP, the United Nations Educational, Scientific and Cultural Organization, the World Meteorological Organization and ICSU. The Global Terrestrial Observing System has two sister observing systems, the Global Climate Observing System and the Global Oceanic Observing System. More information can be found at www.fao.org/gtos.

64. The primary role of the Global Terrestrial Observing System is to act as a data broker and bring researchers and modellers together in order better to understand

global processes of change in areas such as climate change and biodiversity. The Terrestrial Ecosystem Monitoring Sites database is an effort led by the Global Terrestrial Observing System to enhance collaboration between sites and to provide a framework for researchers, resource managers and decision makers who seek data to support their efforts at the regional and global level (see www.fao.org/gtos/tems). The 2002 user survey confirmed the great need for:

(a) Free data-sharing, including satellite imagery and remote sensing products to assist developing countries in developing their own capacities;

(b) Linking in situ and satellite data to provide invaluable validation data to improve and assess the accuracy of satellite products;

(c) Intensifying the harmonization, standardization and quality of long-term terrestrial data by developing and disseminating methodology to achieve interoperability and foster collaboration between national and international initiatives.

65. The Terrestrial Carbon Observations network (see www.fao.org/gtos/tco.html) is another key focus of activities under the Global Terrestrial Observing System. The network uses both satellite and ground observations to estimate the spatial and temporal distribution of carbon sources and sinks in the terrestrial biosphere. It aims to design carbon cycling models that are sensitive to both human- and nature-induced environmental change. The models need to operate at a relatively high resolution in order to optimize remote and in situ observations. They must also produce maps of terrestrial carbon sources and sinks on a seasonal, annual, inter-annual and decadal basis. Based on raw and/or pre-processed data originating from different entities, the following main carbon products are envisaged: land-cover types and changes, biomass density, carbon dioxide fluxes and net primary productivity.

66. The Key Indicators Database System is an open software tool for the implementation of licence-free web-browser-delivered information systems. The System presents spatial (vector and raster), statistical and time-series data in maps, tables and charts, allowing the user to view aspects of multi-dimensional data in the most advantageous manner, facilitating data comprehension and analysis. The tool also has an “externalizer”, which allows it to interface directly with other information systems, such as GeoNetwork and the United Nations Children’s Fund ChildInfo software, a database that tracks key indicators in the well-being of children and women. The Key Indicators Database System is being proposed as a contribution to the next version of the DevInfo software tool for tracking Millennium Development Goal data and has been used in numerous systems, including the following inter-agency initiatives:

(a) Mapping of Agricultural Production Systems (Agro-MAPS) subnational agricultural land use statistics, a collaboration of FAO, the International Food Policy Research Institute and the Center for Sustainability and the Global Environment (to be released soon);

(b) The WHO Global Database on Body Mass Index (to be released soon);

(c) The Global Terrestrial Observing System Terrestrial Ecosystem Monitoring Sites component (see para. 63 above);

(d) FIVIMS for Asian regional and country systems (www.asiafivims.net);

(e) The FIVIMS Key Indicators Mapping System;

(f) The Millennium Development Goals tracking map dissemination component.

Regional Centre for Remote Sensing of the North African States

[Original: French]

1. The activities of the Regional Centre for Remote Sensing of the North African States (CRTEAN) are aimed at:

(a) Encouraging the use of space technology and, in particular, of remote sensing techniques for resolving problems of economic or sustainable development, or both at the national, subregional and international levels;

(b) Strengthening the capabilities of member States in the areas of research and training and research and development in the fields of space technology and remote sensing;

(c) Developing international cooperation and creating effective synergy in the sharing of knowledge and expertise.

2. These objectives, which are clearly defined in the constitution of the Centre, the legal framework governing its operations and activities, fully reflect the spirit of the recommendations of UNISPACE III.

1. Managing natural resources and protecting the environment

3. The Centre implements a regional project to monitor desertification dynamics in arid and semi-arid areas of North Africa (the *Suivi de la dynamique de la désertification en Afrique du Nord* (SUDDAN) project), which addresses the national needs of countries affected by this phenomenon. The project aims to establish a methodological approach to determining the major factors of desertification through the use of remote sensing techniques.

4. In respecting the spirit of the United Nations Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification, particularly in Africa, the SUDDAN project has been established in close collaboration with the African Organization for Cartography and Remote Sensing, which is the African focal point for the Convention.

5. The Centre organized a workshop on mapping forest resources in North Africa and the role of remote sensing in Tunis on 23 and 24 October 2002. The workshop was organized in collaboration with FAO and brought together the forest and remote sensing sectors in each of the countries of the subregion. The workshop made recommendations, in particular on the need to establish a subregional forestry inventory that would serve as a reference for national studies.

6. The Centre publishes the *Lettre du CRTEAN* (CRTEAN newsletter), which constitutes a forum for sharing the experience and expertise of the specialized national institutions of member States. The following volumes have been published:

(a) Volume I. Monitoring desertification in North Africa: role and issues of remote sensing and geographic information systems (GIS): No. 1 (March 1999), National programmes and prospects of North African countries in monitoring and combating desertification; and No. 2 (July 1999 and May 2002 update), Bibliographical references and web sites on desertification;

(b) Volume II. Water resources in North Africa: management and monitoring; the contribution of remote sensing and GIS: No. 4 (July 2000), Scientific articles of member States' specialized institutions on monitoring and managing water resources; No. 5 (May 2001), Bibliographical references, databases and web sites on water resources;

(c) Volume III. Forest resources in North Africa: management and monitoring; role of remote sensing: No. 6 (May 2003), Presentations by experts from States of the subregion and specialist partners to the regional workshop organized in Tunis with FAO in October 2002; recommendations.

7. The Centre is currently preparing a project on small-scale vegetation mapping in North Africa. The methodological phase, applied over a test area in the subregion, has been undertaken in cooperation with the joint research unit, Research Centre for the Organization and Dissemination of Geographic Information of Paris University I and the National Centre for Scientific Research of France. The project aims to produce a vegetation cover map to a scale of 1:250,000 on the basis of remote sensing techniques.

8. The Centre is preparing volume III, No. 7, of the CRTEAN newsletter, dealing with bibliographical references, databases and web sites on forest resources. This issue will cover the ecology of the ecosystem, forest fires, remote sensing and mapping and management and conservation.

2. Using space applications for human security, development and welfare

9. In collaboration with the European Centre for Space Law of ESA, the Centre organized an international seminar on satellite remote sensing in aid of development: legal considerations, held in Tunis on 26 and 27 September 2003. The seminar brought together decision makers and experts from the majority of member States, associate partners and specialists from European and international centres of excellence, as well as from the Office for Outer Space Affairs and culminated in the Tunis Declaration on Promoting Earth Observation to Meet the Needs of the North African Countries, which sets out the main recommendations of the participating States. The Declaration was published in *Space Policy*, vol. 19, No. 2 (May 2003), pp. 143-145 and communicated to the Committee on the Peaceful Uses of Outer Space.

10. In the first quarter of 2004, the Centre plans to organize a regional symposium on natural disasters (earthquakes, floods and forest fires) in North Africa. Organized in collaboration with the European Centre for Space Law, the symposium aims to conduct among member States affected by natural disasters a review of the contribution of satellite data to natural disaster prevention (upstream activities) and management (downstream activities) as well as ways of strengthening consultation, coordination and cooperation.

3. Enhancing education and training opportunities and increasing awareness among decision makers and the general public

11. The Centre organized a training workshop on MERCATOR cartographic publishing software for the design and production of maps, charts and atlas pages, which addressed new cartographic processing methods and was aimed at land surveyors, cartographers and topographers in member and associated States. The workshop was organized with the Belgian partner Star and three sessions have already been held at the Centre's headquarters.

12. A training workshop on high-resolution satellite imaging was held in Tunis on 16 and 17 July 2003, in collaboration with Spot Image, France. The objective of the workshop was to examine the opportunities provided by the new high-resolution satellites for studying natural environments.

13. In 2004, the Centre intends to hold, in collaboration with Spot Image, a regional seminar on applications of remote sensing (cartography, agriculture and the environment). The purpose of the seminar is to review the status of applications among member States and to strengthen subregional and regional consultation and cooperation. The workshop will discuss the availability of near-real-time data and the low-cost acquisition of such data and make recommendations.

14. Beyond the profile of the activities of the Centre, which reflect the concerns of its member States and which are pursued within an appropriate international context, such as the recommendations of UNISPACE III as regards the field of space technology and its applications, specific treaties and conventions, the aim of CRTEAN is to widen continually the circle of actors, with the involvement of the private sector and community organizations.

International Society for Photogrammetry and Remote Sensing

[Original: English]

1. The International Society for Photogrammetry and Remote Sensing (ISPRS) has contributed towards the fulfilment of the UNISPACE III recommendations in several ways. ISPRS held a workshop in Dar es Salaam from 25 to 28 March 2002, entitled "Developments and Technology Transfer in Geomatics for Environmental and Resource Management", in cooperation with the African Association of Remote Sensing of the Environment and the International Institute for Geo-Information Science and Earth Observation.

2. Among the seven mid-term symposiums held in 2002, the following are relevant to UNISPACE III recommendations 11, 18 and 21:

(a) Symposium of Commission IV, "GeoSpatial Theory, Processing and Applications" (Ottawa, 8-12 July 2002);

(b) Symposium of Commission II, "Integrated System for Spatial Data Production, Custodian and Decision Support" (Xian, China, 20-23 August 2002);

(c) Symposium of Commission VI, "New approaches for Education and Communication" (São José dos Campos, Brazil, 16-18 September 2002);

(d) Symposium of Commission I, “Integrated Remote Sensing at the Global Regional and Local Scale” (Denver, United States, 10-15 November 2002);

(e) Symposium of Commission VII, “Resource and environmental Monitoring” (Hyderabad, India, 3-6 December 2002).

3. ISPRS has formed, in collaboration with the European Association of Remote Sensing Laboratories, a Special Interest Group on Multilateral Environmental Agreements, to consider the application of remote sensing for the investigation of multilateral environmental agreements (relevant to UNISPACE III recommendations 1 and 18).

4. ISPRS has included several youth sessions in its programme for the twentieth quadrennial congress, to be held in Istanbul, Turkey, from 12 to 23 July 2004 (relevant to UNISPACE III recommendation 21).

5. ISPRS is planning to include several special sessions at the Congress to consider the UNISPACE III recommendations as well as sessions specifically planned for the Action Team on the Environmental Monitoring Strategy (relevant to UNISPACE III recommendations 1, 11 and 18).

6. ISPRS has recently launched the ISPRS Foundation, which aims to provide funding to worthwhile applicants, especially from developing countries, for programmes in the following categories: awards, awareness education, distance learning, exchange programmes, fellowships, grants, international workshops, internships, preservation and archiving, research initiatives, scholarships, projects on standards, tools and literature and travel grants. Through these programmes, the ISPRS Foundation will provide tangible support for the objectives of ISPRS and recognize and reward outstanding achievements (relevant to UNISPACE III recommendation 25).

Notes

[1] See *Official Records of the General Assembly, Fifty-eighth Session, Supplement No. 20* (A/58/20), para. 50.

[2] Ibid., annex I.