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Report of the Working Group on Education, Training and Capacity Building

SUMMARY AND PURPOSE

The report provides an overview of activities carried out by the Working Group on Education, Training and Capacity Building (WGEdu) in 2004. In response to becoming a standing Working Group of CEOS, the report includes an updated CEOS Strategy for Earth Observation Education and Training and an associated Plan of Action for the work of the WGEdu in 2005 (Doc. No. 13.1, a and a description of the CEOS Education Portal which is now functional. The report includes a list of activities carried out or supported by members of the WGEdu that integrate capacity building within specific projects or that aid potential satellite data users to understand how data products and space-derived services can benefit them.

ACTION/DECISION PROPOSED

The 18th Plenary participants are invited to:

- (a) Comment on and take action on the following documents:
 - (i) WGEdu Revised Strategy for Earth Observation Education and Training and Capacity Building; and WGEdu Plan of Action for 2005 (Doc. 13.1);
 - (ii) Progress report on a plan to implement the “Principles of Satellite Data Provision in Support of Earth Observation Training and Education” (Doc. No. 13.2).
- (b) Note that the the CEOS Education Portal is now functional and invite all Members and Associates to contribute to populate the Education Portal;
- (c) Endorse the proposal that Yolanda Berenguer of UNESCO to step up as Co-chair of the WGEdu
- (d) Note and support in the inter-Plenary period the recommendations contained in the Report of the WGEdu.

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Report of the Working Group on Earth Observation Education, Training and Capacity Building

Introduction

At the 17th CEOS Plenary, the Working Group on Education, Training and Capacity Building (WGEdu) proposed a number of activities that it would carry out as part of its plan of action for 2004. The proposed activities were endorsed by the Plenary. The 17th Plenary also agreed on a number of action items that required contributions from the WGEdu. The above-mentioned activities and the action items called for by the 17th Plenary constituted the Plan of action of the WGEdu for 2004. The WGEdu coordinated its programme of work through teleconference meetings and at its annual meeting held from 24 to 25 May, 2004 at the FAO Headquarters in Rome. The results of major activities of the WGEdu in 2004 are presented in this report to the 18th CEOS Plenary along with recommendations and specific proposals on which Plenary is invited to take action.

CEOS Education Portal – Functional Demonstration

The WGEdu has completed the development of the CEOS Education, Training and Capacity Building Resources Portal (Education Portal for short). A demonstration of the Portal will be presented to the 18th Plenary. The goal of the Education Portal is twofold; 1) it will make Earth observation education and training resources created by various CEOS members and associates more visible and searchable and 2) will provide numerous links (URLs) where teachers, students and professionals alike may take advantage of established training courses and materials, including satellite data, much of it free of charge, through distance learning.

The basic database that sits behind the Portal was originally developed by CCRS, NASDA/AIT and EUMETSAT. A dynamic searching interface, originally developed by NASDA/AIT, has been updated by Peking University (PKU) and National Remote Sensing Centre of China (NRSCC) to provide a user-friendly mechanism for searching purposes.

The Portal can be found in the Educational Resources area of:

http://ceos.pku.edu.cn/wgedu/home1_e.html

A set of meta-data, which categorises the information into a set of search fields was established (by CCRS and more recently EUMETSAT) and forms the basis of search criteria. Searching is currently performed using a conventional text-based interface.

The use of URLs ensures that students accessing the resources available online are accessing the most recently available information. All CEOS agencies have been asked to contribute data to the database and, so far, most of the information is web based. Periodic reminders for inputs or updates to the Portal content will be sent to CEOS Members and Associates by the WGEdu. It is foreseen that eventually CEOS agencies (and others) will be able to upload their own materials. WGEdu is also exploring the possibility to link its resources portal with CEOS/WGISS's data portal that is under development and other education-related portals. Furthermore, consideration is being given (by PKU/NRSCC) to enhancing the search facility by taking advantage of the latest tools for web-based geospatial information and knowledge management.

Recommendation to CEOS: The 18th Plenary participants are invited to comment on the Education Portal and to endorse it. Members and Associates are invited to provide the information needed to include in the Portal's database their institution's meta data regarding educational resources.

Strategy for Earth Observation Training and Education and Capacity Building [17-13]

The status of the WGEdu was changed by the 17th Plenary from "ad hoc" to that of a standing Working Group of CEOS. The WGEdu was requested to review its terms of reference and propose necessary revisions to them at the 18th Plenary. The ad hoc WGEdu was established by a resolution of the 13th CEOS Plenary that requested the WGEdu to prepare a strategy for future CEOS activities in education and training in developing countries. The 15th CEOS Plenary adopted the strategy proposed by the ad hoc WGEdu together with an Action Plan to translate the strategy into actions that can be implemented. As the ad hoc Working Group was established on the basis of the CEOS Strategy for Earth Observation Training and Education and Capacity Building, with specific emphasis on the developing world, the WGEdu reviewed and updated this education strategy bearing in mind the need and advantages of linkages with other capacity building initiatives (e.g. Module 1 of the CEOS WSSD Follow up Programme, GEO Subgroup on Capacity Building). The WGEdu is also proposing an associated Plan of Action that is in line with the Strategy for its work in 2005. The updated Strategy and the associated WGEdu plan of action for 2005 are presented for consideration of the 18th Plenary in Document 13.1.

Action: The 18th Plenary participants are invited to comment on and approve the WGEdu revised Education Strategy and its Plan of Action for 2005.

Implementation of the CEOS "Principles of Satellite Data Provision in Support of Earth Observation Training and Education"

The "Principles of Satellite Data Provision in Support of Earth Observation Training and Education" (heretofore referred to as "data access principles") were proposed by the WGEdu and adopted by the 17th CEOS Plenary. These principles provide a framework for agencies to support of Earth observation education, training and capacity building, within available resources and consistent with agency data policies.

For the data access principles to be implemented, there is a need for a simple plan of implementation that allows bona fide educators to apply for limited amounts of data for education, training and capacity building purposes, particularly in the developing countries. The WGEdu worked on this concept and in the process concluded that there exist a number of types of Earth observation data that are already available, free or at reasonable cost, for education, training and capacity building purposes. Awareness of these types of data and on how to access them would be a valuable resource for a large number of educators, students and practitioners.

The WGEdu identified four categories of data to which educators, students and practitioners should obtain increased access. These categories are: (1) Sample Data Sets from various satellites (often available through the Internet); (2) Case Study Datasets (multiple types of data that are brought together into a case study and often available from satellite operators); (3) Significant Event Data Sets

(near-real-time data used to follow a specific event); and (4) Archived or Near-Real-Time Data to Support Professional Development (multi-temporal, multi-sensor satellite data needed to build operational capacity).

The WGEdu noted that there are data sets from categories (1) - (3) that are available through the Internet and through ad hoc arrangements. Beginning in 2005, the URLs for data on the Internet would be included in the CEOS Education Portal to make the data available to a large number of educators, students and practitioners to build capacity in all Earth observation applications.

The implementation of the data access principles should therefore focus on data category (4) and should be simple for the educator community and for the satellite operators to carry out. The WGEdu undertook that task and has prepared a progress report on a plan of implementation that it is presenting to the 18th CEOS Plenary (Document 13.2). In essence, potential recipients of satellite data would complete a simple application form that would be evaluated by a subcommittee that includes individuals with experience in the applications of satellite data. Applications that meet a set of established criteria would be transmitted to the relevant satellite operators for them to consider whether the requested data could be provided and on what terms. The WGEdu also agreed to carry out a pilot project in 2005 to test the draft implementation plan that would be presented to the 19th Plenary. The pilot project would include three types of users: the African Advisory Group, a group of universities (coordinated by Peking University) and the Regional Centres for Space Science and Technology Education, affiliated to the United Nations. These two actions by the WGEdu are included in its proposed Plan of Action for 2005. The value of data in category (4) to operational capacity building is further elaborated in the WGEdu progress report to CEOS Plenary.

Action: The 18th Plenary participants are invited to comment and to approve the proposed direction being followed by the WGEdu to develop the plan of implementation of the CEOS “Principles of Satellite Data Provision in Support of Earth Observation Training and Education” as reflected in its progress report (Document 13.2).

WGEdu leadership

The WGEdu has a Chair, provided by UN-OOSA and two Co-Chairs, provided by the Canada Center for Remote Sensing (CCRS) and by the European Space Agency (ESA). Due to the assumption of new responsibilities within CCRS, Christine Hutton will need to step down as Co-chair of WGEdu by the time of the 18th CEOS Plenary. The WGEdu recognizes the excellent work of C. Hutton as Co-chair and appreciates that she will remain as a member of the Working Group.

As CCRS does not intend to propose a replacement for Christine Hutton, the Chair of the WGEdu proposes to Plenary that Yolanda Berenguer, of UNESCO and an active member of the WGEdu, be appointed as Co-chair. Ms. Berenguer is professionally involved in space education matters and interested in assuming the position of Co-chair. It should be noted that Maurizio Fea of ESA will need to step down before the 19th Plenary. In due course, ESA will be requested to indicate whether it intends to present a replacement for M. Fea.

Action: Participants at the 18th Plenary are invited to endorse the proposal that Yolanda Berenguer of UNESCO to step up as Co-chair of the WGEdu.

Up-dates for the CEOS Five Year Plan [17-03]

The WGEdu provided its inputs for the updating of the CEOS Five Year Plan. In addition to updating the text relevant to the WGEdu, its contributions to the Plan focused on building and strengthening linkages with other on-going capacity building efforts such as those of the Module 1 of the CEOS WSSD Follow up Programme and the capacity building efforts of the GEO process.

Implementation of recommendations by the CEOS ad hoc Team on Utilization and by CEOS Plenary [17-04, 17-06]

The WGEdu contributed to implement the recommendation of the CEOS ad hoc Team on Utilization that requests CEOS Members and Associates and the WGEdu in particular, that wherever possible capacity building be integrated within specific projects. As requested by the 17th Plenary, the WGEdu took account of this recommendation in activities organized by its members and is providing a non-exhaustive list of events where capacity building elements were included (**see Annex**). The list also includes events that support a similar recommendation by the 17th Plenary to aid potential satellite data users to understand how data products and space-derived services can benefit them.

Recommendation to CEOS: CEOS Members and Associates should strongly support new satellite data utilization activities through the organization, jointly with the WGEdu, of intensive training courses and workshops at the regional level for experts, managers and practitioners. Alternative support that should be provided by CEOS Members and Associates to sponsor the participation of experts, to give lectures and present case studies at such events.

Actions to involve the African Advisory Group in the implementation of activities [17-07]

CEOS Agencies, WGEdu, and WSSD Follow-up Programme Modules were encouraged by the 17th Plenary to involve the CEOS African Advisory Group in the implementation activities. The African Advisory Group (AAG) was invited as an observer and participated actively in the annual WGEdu meeting in Rome. At the meeting, the AAG indicated their interest in being part of the pilot project proposed by the WGEdu to test the plan of implementation of the data access principles that would provide satellite data for education purposes. The AAG also indicated that it would:

- a) Work towards a coherent use of GIS and remote sensing technologies for the economic development of the African Countries. This would be promoted through enhanced education, training and capacity building opportunities for African institutions.
- b) Enhance integration of education, training and capacity building through implementation of activities of the CEOS WSSD Follow-up Programme;
- c) Identify challenges for education, training and capacity building at national regional and international, levels and undertake country assessments to determine requirements for making efficient and operational use of WGEdu capacity building products in Africa.

Some of those actions are to be undertaken by the AAG on its own and some in coordination with and support from the WGEdu and its membership. In particular, coordination is needed to identify African events where WGEdu presence and presentations could highlight and support AAG objectives.

Recommendation made by the AAG: Coordination of activities at African Events – there should be CEOS presence and presentations at important events to highlight activities. A list of such events would be provided by the AAG to the WGEdu. The WGEdu would distribute that list to CEOS SEC and the other CEOS Working Groups so that participation could be coordinate as appropriate and possible.

Follow up: The WGEdu participated at the 5th African Association of Remote Sensing of the Environment (AARSE) International Conference in Nairobi, Kenya from 18 to 23 October, 2004.

Increase in the WGEdu membership [17-10]

The purpose of this action was to involve more CEOS institutions with the development and implementation of the WGEdu portal website, implementation of WGEdu Data Principles, collaboration with the WSSD Module 1, and to maintain WGEdu linkages to the broader education, training and capacity building community. Members and Associates were invited by the Chair of the WGEdu to re-confirm or nominate their representatives to the WGEdu. As a result, the 5th WGEdu meeting had new participants from USGS, CSA and Peking University and NASA identified its new representative.

Recommendation: Members and Associates are invited to promote the active participation of their representatives in the work of the WGEdu.

Looking for appropriate linkages to IGOS Themes [17-16]

This call was made by the 17th Plenary to all agencies and working groups in general. The WGEdu and the IGOS Water Cycle Theme have cooperated on the planning and/or implementation of three activities: 1) Collaboration on the Capacity Building sessions and implementation components of the TIGER workshop in Pretoria; 2) Coordination and integration of efforts for the CSD in April 2005 which is focused on Water Resources and Sanitation; and 3) cooperation on the planning of three capacity building workshops to assist in the implementation of the Water Cycle Theme. These workshops are planned to take place in Africa, Latin America and Asia.

Recommendation: Agencies and Working Groups, that carry out education, training or capacity building activities that support the IGOS Themes could submit resulting material (studies, reports) to the CEOS Education Portal.

Support for activities of the CEOS WSSD Follow-up Programme Modules 1 and 2 (Capacity Building and Water Resource Management) [17-08]

Several of the activities carried out by the WGEdu and its membership were direct contributions to the work being carried out by WSSD Module 1 and Module 2. The WGEdu and Module 1 have coordinated capacity building efforts and have participated in each others activities since 2003. The Chair and some members of Module 1 and Module 2 participated in the meeting of the WGEdu in Rome. Most members of the WGEdu present at the Rome meeting participated in the CEOS WSSD Follow up Programme meeting.

The United Nations/International Astronautical Federation Workshop on the Use the Use of Space Technology for the Benefit of Developing Countries, with focus on capacity building for the “Use of Space Technology for Disaster Management”, held in Vancouver, Canada, from 1-2 October 2004 was among the activities coordinated with Module 1. The results of this Workshop were presented at the *United Nations International Workshop on the Use of Space Technology for Disaster Management*, held in Munich, Germany from 18 to 22 October 2004 and will be forwarded to the World Conference on Disaster Reduction, to be held in Kobe, Japan in January 2005.

An activity coordinated with Module 2, and specifically oriented to support the objectives of ESA’s TIGER project, was the *United Nations/Austria/ESA Symposium on the Operational Use of Space Technology in Sustainable Development*, under the theme “Water for the World: Space Solutions for Water Management”, held in Graz, Austria from 13 to 16 September 2004. The results of this Workshop are aimed at initiating one or more pilot projects leading to operational use of Earth observation data by water river/basin commissions in developing countries, particularly in Africa, in 2005.

The WGEdu will also participate pro-actively in the Joint Workshop of WSSD Modules, 1, 2 and 3 at Pretoria, South Africa, to be held from 8-10 November 2004. The CEOS WGEdu plans to make the Education Portal available to participants in the Joint Workshop.

In coordination with Module 1, the WGEdu contributed to work of Action Team 17, the under the leadership of Japan, to implement a capacity building recommendation of the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III). That recommendation calls for enhancing capacity building through the development of human and budgetary resources, the training and professional development of teachers, the exchange of teaching methods, materials and experience and the development of infrastructure and public policy.

Overall, sound linkages are being developed with a number of important international capacity building efforts. The aim of the WGEdu is to coordinate through existing linkages and establish new ones for the exchange of capacity building information, including established teaching methods, training materials and expertise.

WGEdu contributions to GEO Subgroup on Capacity Building

Members of the WGEdu made extensive substantive contributions to the report Sub-Group on Capacity Building (SGCB) of the Group on Earth Observations (GEO), to the Framework Document and provided support to the Implementation Plan Task Team in its development of the 10-Year Implementation Plan for a Global Earth Observation System of Systems (GOESS). The participation of the WGEdu in all phases of the work of the Sub-Group on Capacity Building (SGCB) of the Group on Earth Observations (GEO) deserves a special mention among the linkages being established by the WGEdu. For GOESS to have the impact desired on the societal benefits that could be derived, it must include the developing countries as operational users. This will only be possible through concerted efforts to assist the developing countries to build capacity in the Earth observation applications. In fact, the scope of capacity building efforts being outlined by the GEO SGCB would require the coordinated efforts inherent in all linkages mentioned above, plus other linkages.

Contributions by the membership of the WGEdu to implement CEOS Action Items 17-04 and 17-06

**Earth Observation Training Related to On-going Pilot Projects in 2004
(Capacity building in Earth observation)**

	<i>Programme - Project Title</i>	<i>Scope - Objectives</i>	<i>Schedule - Deadlines</i> <i>Budget/Costs</i> <i>Status</i>
1	Global Landsat Data Sets Expert Meeting Organized by UN-OOSA during the 5th African Association of Remote Sensing of the Environment Conference Nairobi, Kenya, 18 to 23 October, 2004	Landsat Expert Meeting for African Remote Sensing Specialists on accessing data sub sets from a data base of all Africa	Build upon the strategy put forward at the Dakar Expert Meeting. Provide Landsat data to up to 10 requests (includes setting up a computer with all the African Landsat data).
2	Training course within the UN/European Space Agency follow-up project on use of Earth observation data for water resources management. Included as Part of ESA's TIGER Project for CEOS WSSD Follow up Programme. March 2004	To identify and quantify surface water resources in Burkina Faso, Niger and neighbouring countries. In cooperation with AGRHYMET (Niger)	On-going project. ESA to buy Hardware and Software; OOSA to provide fellowships to African trainees. UN/ESA design of training course.

**Long-term Earth Observation Education Programmes
organized by the UN-affiliated Regional Centres for Space Science and Technology Education in 2004**

	Long-Term Courses On-Going Courses are followed by a one-year pilot project in the student's country	Other Activities Planned
1	<p>8th Post-Graduate Course in Remote Sensing & Geographic Information System</p> <p><i>Indian Institute of Remote Sensing (IIRS), Dehradun, India, 1 October 2003-30 June 2004</i></p>	
2	<p>3rd Post-Graduate Course in Remote Sensing & Geographic Information System</p> <p><i>Rabat, Morocco, 8 December 2003-October 2004</i></p> <p>2nd Post-Graduate Course in Satellite Meteorology and Global Climate</p> <p><i>Rabat, Morocco, March-December 2004</i></p>	<p>The Centre is planning to conduct an "International Conference on the contribution of Space Science and Technology to the sustainable development of Africa" in December 2004, Rabat, Morocco.</p> <p>Through the USDS Landsat grant, the Centre will receive a computer with Landsat data for the region and will also develop a three-day workshop on the use of this data (DS).</p>
3	<p>2nd Post-Graduate Course in Satellite Meteorology</p> <p><i>Obafemi Awolowo University Campus, Ile-ife, Nigeria, November 2003-July 2004</i></p> <p>3rd Post-Graduate Course in Remote Sensing & Geographic Information System</p> <p><i>Obafemi Awolowo University Campus, Ile-Ife, Nigeria, November 2003-July 2004</i></p>	<p>Normally, before the commencement of a Post-Graduate Course, the Centre organizes a workshop in a topic related to the subject of the course.</p>
4	<p>2nd Post-Graduate Course in Remote Sensing & Geographic Information System</p> <p><i>INPE, São José dos Campos, Brazil, March-November 2004</i></p>	

Workshops organized by the United States Geological Survey (USGS) in 2004

	<i>Title</i>
1	Workshop on Time-series Land Use / Land Cover Mapping ¹ Niger, March 2004 (organized by USGS in cooperation with AGRHYMET)
2	Workshop on Quantifying Carbon Sequestration in Soils and Vegetation, for Sahel country scientists, AGRHYMET ² July 2004 (organized by USGS in cooperation with AGRHYMET)
3	Workshop on Using MODIS for Land Productivity Applications in the Sahel ³ September 2004 (organized by USGS in cooperation with AGRHYMET)

1 Part of a yearly series since 1999

2. Part of a series since 2001

3. Part of a series since 2001

**Workshops, Training Course, Expert Meeting and Symposia
organized by the United Nations Office for Outer Space Affairs in 2004**

	<i>Activity Title</i>	<i>Objectives</i>
1	UN/Sudan Workshop on the Use of Space Technology for Natural Resources Management, Environmental Monitoring and Disaster Management Khartoum, Sudan, 4-8 April 2004	The goal of this regional workshop was to facilitate the inclusion of space technologies into operational programmes in Africa and Western Asia, focusing on increasing the awareness of managers and decision-makers of the potential benefits of using space-based technologies in their programmes.
2	UN/Islamic Republic of Iran Workshop on the Use of Space Technology for Environmental Security, Disaster Rehabilitation and Sustainable Development Tehran, Iran, 8-12 May 2004	The objectives of this Regional Workshop was to increase the awareness of managers and decision makers dealing with environmental issues and disaster problems of the potential benefits of using space technologies.
3	14th UN/Sweden International Training Course on Remote Sensing Education for Educators Stockholm & Kiruna, Sweden, 3 May-11 June 2004	To enable university educators from developing countries to include remote sensing in their curricula in fields such as forestry, agriculture, mineral resources and coastal management.
4	UN/SUPARCO Regional Workshop on Monitoring and Protection of the Natural Environment: Educational Needs and Experience Gained from UN/Sweden Training Courses on Remote Sensing Education for Educators Islamabad, Pakistan, 30 August-4 September 2004	To evaluate the local impact of the series of the UN/Sweden Training Courses, to find the major reasons for a high/low rate of success in implementing the knowledge received in Sweden, and to identify the nature and scope of possible support to ensure that on-going efforts have established firm roots within the educational communities in developing countries of the region.
5	UN/Austria/ESA Symposium on the Operational Use of Space Technology in Sustainable Development Graz, Austria, 13-16 September 2004	To identify ways and means to use space technology application to support the management of water resources. While the issues covered, technical presentations and discussions were at the international level, particular attention was paid to activities being carried out under Module 2 of the CEOS World Summit on Sustainable Development Follow-up Programme. This Symposium was linked to the TIGER project, which is ESA's contribution to the 2004 activities of Module 2.

	Activity Title	Objectives
6	UN/International Astronautical Federation Workshop on the Use the Use of Space Technology for the Benefit of Developing Countries Vancouver, Canada, 1-2 October 2004	To review a number of capacity building initiatives in the area of disaster management and education that are carried out by various entities through international cooperation and to look for ways to build synergies among them. The workshop covered scientific, Earth observation, and telecommunication missions.
7	UN/Saudi Arabia Regional Workshop on the Use of Space Technology for Disaster Management for Western Asia Riyadh, Saudi Arabia, 2-6 October 2004	To increase the awareness of managers and decision makers involved in disaster management of the potential benefits and the cost-effectiveness of using space technologies; determine the types of information and communications required to manage specific disasters and the extent to which these requirements could be met by space technologies; define possible pilot projects that incorporate and test the use of space-technology tools in disaster management.
8	UN International Workshop on the Use of Space Technology for Disaster Management Munich, Germany, 18-22 October 2004	This international workshop was a wrap-up for the previous five regional workshops held on space technology and disaster management focusing on a common vision and approach across regions, setting guidelines for the development of an global disaster management system, building upon the recommendations of Action Team 7 and other international initiatives such as GEO and GMES.
9	UN/European Space Agency/Austria/Switzerland Workshop on Remote Sensing in the Service of Sustainable Development in Mountain Areas (I) Kathmandu, Nepal, 15-19 November 2004 (The 1 st of a series of planned three)	To train participants in using remote sensing data for programmes in sustainable development in mountain areas. Through follow up pilot projects, the participants should be afterwards able to interpret remote sensing data and its application and use in development projects in mountain areas.