

TECHNICAL COMMISSION VII: Resource and Environmental Monitoring

President: Dr.Gábor Remetey-Fülöpp (Hungary)

Secretary: Péter Winkler (Hungary)

Secretary: Frank Hegyi (Canada)

<http://www.hegyi.com/isprsc7>

State of Science and Technology of Commission VII Topics

Applied remote sensing has become an inevitable technology tool contributing to human's progress toward sustainability, by supporting the solution of environment-related tasks on local, regional and global levels. It has helped policy decision making to reduce negative societal-economic impacts and assist in ensuring sustainable development on the long term. Remote sensing will be an ntegrated part of the advanced Information Technology and Telecommunication infrastructure, the foundation of the information society. Building spectral databases and cross-border, continental or global large datasets, refining validation, calibration procedures in multi-source, multi-temporal environment, and paving the way for standardisation, are some of the strategic imperatives of the application oriented research and development initiatives. Additional major challenges are the exploitation of research and the global co-operation, where the application potential brings direct benefits in climate change research, agriculture, environmental monitoring, cartography, water resources management.

Major improvements are especially in the hyperspectral opportunities, data fusion, storage, management and retrieval of large datasets. The accelerating impact of the development of enabling technologies (computer industry, Internet, high-speed communication) should be also emphasized. Important is the timely use of data in extraction and interpretation by digital image processing, pattern recognition and feature identification. Data quality issues play an important role: how accurate the results are? Satellite segment, extensive ground segment for processing, archival and distribution as well as data readily available to general scientific users have been realised e.g. in the Earth Observing System of NASA. Facilities such as the EDC DAAC provide extensive Internet data access (e.g. AVHRR, DEM, Landsat, radar) for the interdisciplinary user community thus providing a better understanding of the Earth as a total system. NASA's major scientific priorities in spectral sensing research applications focuses for the next 10 years on atmospheric chemistry and ozone, seasonal and annual climate variability, long term climate change, land cover/use change and global productivity and natural hazard mitigation by observation, understanding, building models and implement scientific assessments. According to G.Asrar at the ISSSR conference, there is a need for a pathfinder for international policy decision making (e.g. documenting the ozone hole, the ozone loss is

anthropogen). The present challenge: can we learn to predict regional climate variations from months to a year in advance? Next challenge: there is a need for systematic, calibrated, long term data records, and their assimilation into already existing general circular models (including oceans, atmosphere, cryosphere, land and biosphere) under evolution. To do so, even more diverse data are required. Future challenge: we have only the beginning of an observational strategy for global assessment of the ecosystem behaviour. The integration of global-to-regional-to-local scale observation is especially challenging. According to this strategy, a large number of missions is expected in the forthcoming years.

The Digital Earth - Understanding our planet in the 21st Century is a vision closely related with the subject.

The document released by Al Gore in February 1998 begins: "A new wave of technological innovation is allowing us to capture, store, process and display an unprecedented amount of information about our planet and a wide variety of environmental and cultural phenomena. Much of this information will be 'georeferenced' - " Similar way, the synergetic impact of remote sensing and the GI will be the major theme of the ISPRS Congress in Amsterdam selecting the motto "Geoinformation for All".

Accomplishments of Commission VII during 1998

Inter-commission Activities

An international Workshop on GIS, Airborne Remote Sensing and Geospatial Clearinghouse was held in Budapest between 19-20 February, 1998. Based on the agreement with ISPRS Commission III President Prof.Dr.Toni Schenk, and approved by the Council, the event was registered as official inter-commission event of ISPRS. Dr. Beáta Csató of the Ohio State University and dr. Erzsébet Merényi of the University of Arizona in Tucson, both officers of the ISPRS Commission III, as well as experts from the USGS, Finland, UK, Germany and Austria were represented the international expert community. Sponsored by the US- Hungarian Science Technology Joint Fund, the event was hosted by the Geological Institute of Hungary, Hungarian Geological Survey (MÁFI). The workshop dealt with issues related to geospatial databases, state-of-the-art of tools and methods including photogrammetry, remote sensing, airborne geophysics, multispectral, hyperspectral sensors and methods, geophysical and geological interpretation methods as well as multiple sensor integration. Dr. Péter Kardeván principal project scientist has submitted an in-depth report on the workshop to ISPRS Highlights for publication.

Further excellent co-operation was established by Dr.Shintaro Goto and dr.Mark Imhoff of WG VII/5 with the ISPRS WG IV/6 chaired by Prof.dr.Ryutaro Tateishi in the field of development and application of global datasets and databases. Prof.Tateishi took also active part on the Commission VII Symposium in Budapest in September 1998 and it is expected, his WG Workshop dedicated to "Better direction of Global Environmental Database Development" will be participated also by Commission VII scientists in November 1999.

The Mid-term Symposium of the Commission VII

The Symposium (referred also as ECO BP '98) was devoted to Resources and Environmental Monitoring, topics of the Technical Commission VII. Held in Budapest from 1-4 September 1998, the event attracted 196 registered participants (including many of the ISPRS Council members) from 33 countries of 5 continents (35 from Hungary). Moreover 62 invited Hungarian senior decision makers and additional 59 professional visitors were attended the open day devoted to commercial exhibitions and presentations. From the scientific point of view ECO BP '98 was a great success. Major application areas where novel research and technology development methodology were applied include hyperspectral sensing, environmental risk and/or site analysis, global, regional and local monitoring as well as assessments related to sustainable developments. The synergetic integrated use of RS and GIS technologies was the case in the majority of applications. The Proceedings of the Symposium are available by RICS Books for sale. Address: Surveyour Court, Westwood Way, Coventry, CV4 8JE United Kingdom, Fax: +44/171-334-3800.

WG VII/1 - Fundamental Physics and Modelling

Chairperson: Dr. Karl Staenz

Co-Chairperson: Prof. Dr. Jan G.P.W. Clevers

Secretary: Dr. Philippe M. Teillet

State of Science and Technology of WG VII/1

The ISPRS WG VII event, the 7th International Symposium on Physical Measurements and Signatures in Remote Sensing, summarized the present state-of-the-art as well as the trend in the various areas such as physical modelling, retrieval/inversion methods, data pre-processing, bio-geo-physical and chemical parameter estimation, satellite data assimilation, and applications. A special issue of the journal Remote Sensing of Environment with refereed papers arising from this symposium is in press. Emphasis in the future will be on the development of hyperspectral remote sensing with spaceborne sensors under construction, such as US Navy's Naval Earth Map Observer (NEMO) and Orbimage's Warfighter, as well as sensor systems in a planning stage such as the Australian Resource Information and Environment Satellite (ARIES) and the German Smart SPECTRAL imaging spectrometer. The synergistic use of data from these sensors with other optical instruments and SAR is another WG priority. Other objectives include the validation and use of parameters derived from calibrated satellite sensor data in land process models as well as the utilization of the BRDF effect for the extraction of information as stipulated in ESA's Land-Surface Interactions Mission (LSPIM).

Accomplishments of ISPRS WG VII/1 during 1998

The major activity of WG VII/1 was the organization of two sessions at the ISPRS VII mid-term symposium "ECO BPi½98 - International Symposium on Resource and Environmental Monitoring" held in Budapest, September 1998. The topics of the sessions were as follows:

- Towards improved geometry and radiometry of remotely sensed data;
- Experimental methods and procedures in remote sensing.

Nine papers were presented during the sessions. Highlights included surface reflectance retrieval incorporating linear polarization and georadiometric effects, stereo matching using neural networks, and signal-to-noise improvements involving multiple linear array Charge Coupled Devices (CCDs). Additional topics covered the correction of airborne and satellite attitude platform fluctuation. A new hyperspectral airborne sensor system, APEX (Airborne PRISM Experiment), was presented. This system is currently under development by ESA for use with its spaceborne PRISM (Processes Research for Imaging Spectrometry Mission). Experimental results were presented on the retrieval of leaf area index (LAI) extracted from end-member fraction images with a new method.

Much of the research and development related to the WG topic has been reported in recent workshops and conferences. Progress in the fundamental development of imaging spectrometry (hyperspectral remote sensing) has been presented at NASA's 6th Annual Geoscience and Airborne Workshop (Pasadena, January 1998), the International SPIE Conference on Imaging Spectrometry III (San Diego, July 1998), and the 1st EARSeL Workshop on Imaging Spectroscopy (Zurich, October 1998).

Proposed Future Working Group Program and Workshop Planned for 1999

The main event in 1999 for the WG VII/1 will be the involvement in the organization of the International Symposium on Spectral Sensing Research (ISSSR) to be held in Las Vegas in October. This will be the fifth symposium in a series of outstanding events covering both military and civilian research in the field of spectroscopy. In addition, participation in a workshop on Integrated Sensor Calibration and Orientation organized by WG III/1 in Portland, Maine, USA is planned for June 1999. Negotiations about the 8th International Symposium on Physical Measurements and Signatures in Remote Sensing, which is the main event of WG VII/1, are underway with CNES to hold this conference in the beginning of 2000 in the French Alps.

ISPRS is now a CEOS affiliate. At the 14th meeting of the CEOS Working Group on Calibration and Validation (WGCV, Tokyo, July 1998), it was recommended that a special session on CEOS Cal/Val be proposed for the next ISPRS Congress in Amsterdam in 2000; the four most relevant ISPRS Working Groups, including WG VII/1, will be invited to help coordinate and participate in this session

WG VII/2 - Application of Remote Sensing and GIS for Sustainable Development

Chairperson: Dr. Dasika P. Rao

Co-chairperson: Dr. Vernon Singhroy

Secretary: Dr.S.K.Subramanian

Accomplishments of ISPRS WG VII/ during 1998

An International Tutorial on Remote Sensing & GIS in Decision Making for Sustainable Rural Development was conducted at Indian Institute of Remote Sensing (National Remote Sensing Agency), Dehradun, India during October 7-9, 1998. There was overwhelming response in attending the Tutorial by the experts from various developing countries including India. 17 number of ex-scientists from various

disciplines of scientific workers, academicians and scholars from 9 countries of Asia Pacific region viz. Bangladesh, Fiji, India, Indonesia, Myanmar, Nepal, Philippines, Srilanka and Vietnam participated in the course programme. The tutorial course was suitably designed with 12 lectures and 5 demonstrations covering topics on technology, its progress and on application areas which have relevance to the needs of sustainable development. The course started with a Key Note Address on Space Technology and Sustainable Development by Dr.D.P.Rao, Chair, WG-VII/2. The Tutorial lectures were delivered by senior scientists of Department of Space from various sub-units viz. Indian Space Research Organisation, Space Applications Centre, National Remote Sensing Agency, Regional Remote Sensing Service Centres, Advanced Data processing Research Institute and the Indian council of Agricultural Research. The Central Soil, Water Conservation and Research Institute as well as from Centre of Space Science Technology & Education for Asia-Pacific Region affiliated to United Nations. The various topics covered are "Overview of Remote Sensing Technology", Profile of Indian Satellites catering to the Developmental needs", Satellite Data Products, Information Extraction Techniques, Application of Remote Sensing in Geoscientific studies, Land, Soil-Water, Vegetation Resources, Biodiversity and Environmental Aspects, as well as Socio-Economic Aspects. The demonstrations through computers, slides and LCD projector were used to cover the topics on satellite data products, digital image processing and analysis, ground water & mineral investigation and land hazard mapping. Hands on experience on use of software (Geosmart, GELAP, Decision Space etc.) and Watershed Development & Management were demonstrated. The course ended with distribution of certificates to course participants. Welcome dinner on October 7, was sponsored by Director, NRSA and a social get together was sponsored by Director, CSSTE-AP on October 8, 1998

Proposed Future Working Group Program and Workshop Planned for 1999

The Tutorial which we have planned earlier (as per work programme submitted in 1996) on Environmental Modelling & GIS is being planned to conduct at Indian Institute of Remote Sensing (NRSA), Dehradun, India on March 11, 1999. This will be a part of Post International Conference on Geoinformatics for Natural Resources Assessment Monitoring and Management entitled "Geoinformatics Beyond 2000"

WG VII/3 - Thematic Application of High Spatial Resolution Satellite Imagery

Chairperson : Prof.Dr.Bruce Forster

Co-Chairperson:

Accomplishments of ISPRS WG VII/3 during 1998

The major activities of WG VII/3 during 1998 were the organisation and conduct of a special workshop on high spatial resolution in collaboration with the Australasian Conference on Remote Sensing and Photogrammetry, held in Sydney, Australia in July 1998, and support of Commission VII's Conference, ECO BP'98 held in Budapest in September, 1998. Professor Forster chaired the three sessions allocated to WG 3, and a number of excellent papers were presented. More details of the conference can be found in the Commission VII's Inter Congress Symposium Report published by the ISPRS Highlights Vol. 3, No 4 p-13-17, December, 1998. The major aim of the workshop was to increase both the scientific and user communities awareness of the

new data and of both the potential and problems associated with it. This was a follow on to a similar workshop held in Association with the Asian Remote Sensing Conference in Kuala Lumpur, Malaysia, in 1997.

The themes of these workshops were directly related to the aims of the working group. Both workshops covered similar topic areas with speakers and representatives from most of the potential system operators. The program and speakers for the Sydney workshop were as follows :

Introduction, Professor Bruce Forster, School of Geomatic Engineering, University of New South Wales, Australia

"Current and future high spatial resolution satellites." Speaker: Larry Fritz, President, ISPRS.

"Comparative analysis of the resolution of air photo and satellite digital images." Speaker: Professor Bruce Forster

"Future Spot high resolution satellite systems." Speakers: Carl McMaster, Spot Imaging Services, Sydney, and Rob Lee, Spot Image..

"Bridging photogrammetric feature extraction and remote sensing image classification" Speaker: Professor Bruce Forster

"Urban and regional applications of high resolution imagery" Speaker: Professor Bruce Forster

"Space imaging satellite systems and their applications." Speaker: Mark Judd, Managing Director, Geomatics Technology, Melbourne, Australia.

"Earthwatch satellite systems and their applications." Speaker: Larry Fritz, on behalf of Earthwatch Incorporated

"Orbimage satellite systems and their applications." Speaker: Timothy Puckorius, Representative of Orbimage.

"Analysis of market for high resolution image data" Speaker: Professor Bruce Forster

The presentations were followed by an open forum. One of the major questions asked related to data cost. It was generally agreed that the cost would be about the same as for acquisition of aerial photography. In addition, in Malaysia, a representative of the Indian Space Program also spoke to the applications of their current and future systems. Approximately 30 people attended the workshop.

Proposed Future Working Group Program and Workshop Planned for 1999

It is proposed to conduct a workshop on specific applications of high spatial resolution data in late 1999. Application areas to be addressed to include -

- precision farming and high value crop monitoring

- civil and other engineering applications
- detailed urban planning and monitoring
- tourism planning and products
- large scale thematic and topographic mapping
- environmental impact assessment
- innovative incorporation into secondary school education and training in biology, geography, history & sciences

The final date and location of the workshop is still being resolved, but it will be held in either North America or Europe in mid to late 1999. It is hoped that real data and real applications will be available at this time. With the proposed launch of Space Imaging's system, it is expected that this will be the case.

WG VII/4 - Computer Assisted Image Interpretation and Analysis

Chairperson: Prof.Dr. Barbara Koch

Co-chairperson: Dr.Alois Sieber

Accomplishments of ISPRS WG VII/4 during 1998

The ISPRS WG VII/4 has participated the ECO BP '98 Symposium from 1st - 4th of September in Budapest. WG VII/4 had two sessions, one under the topic advanced classification techniques and one under the topic automatic image analysis. Altogether 9 proposals were submitted. There was to recognize some emphasis on presentations dealing with neural network classifiers and spectral unmixing. During the meeting the first call of the planned Joint ISPRS and EARSeL workshop taking place from the 3rd to 4th of June 98 in Valladolid, in Spain was presented.

The working group was active in setting up the above mentioned joint workshop on "Fusion of sensor data, knowledge sources and algorithms for extraction and classification of topographic objects". The program and content was circled around by e-mail and mail. Until now 14 abstracts have been submitted and it is expected some more till the deadline 15th of December 98. The workshop is a cooperation with WG III/5, WG IV/III.2 and the EARSeL SIG Group on 'Data Fusion'.

The above mentioned ISPRS - EARSeL workshop is a continuation of the workshop on 'New classification algorithms and data fusion' which took place in Freiburg in 1997. This was a joint meeting between WG VII/4 and the EARSeL SIG group 'Forestry and Land use Planning'. The Proceedings are available at the Dept. of Remote Sensing and Landscape Information Systems (FeLis), University Freiburg, Tennenbacherstr. 4, 79098 Freiburg. Contact person is Mr. Fritz fritzro@felis.uni-freiburg.de. During 1998, WG VII/7 has gained more members. They have now a list of 25.

Proposed Future Working Group Program and Workshop Planned for 1999

Main effort will be put on the ISPRS - EARSeL Joint Workshop and the preparation of the proceedings.

Date: 3-4 June 1999

Title: Joint ISPRS/EARSeL Workshop on Data Fusion

Venue: Valladolid/Spain

For more information please ask Prof.Dr.Barbara Koch, T: +49(761)203-3701, ferninfo@ruf.uni-freiburg.de

WG VII/ 5 - Global Monitoring

Chairperson: Dr. Ake Rosenqvist (since September, 1998)

Co-chairperson: Dr. Mark Imhoff

Secretary: Dr. Shintaro Goto

State of Science and Technology of WG VII/5

Recognizing the significance of the 1997 Kyoto Protocol to the United Nations Framework Convention on Climate Change (UNFCCC) and the 1998 Buenos Aires Amendment, and the importance of remote sensing technology in this context, the WG has modified its Terms of References:

WG VII/5 - revised terms of reference

The Kyoto Protocol stipulates quantified and legally binding national commitments on greenhouse gas emissions. A principal aim of WG VII/5 is to assess the potential and limitations of global scale remote sensing in the context of the Protocol, with particular emphasis on inventories and change monitoring of global carbon stocks. Acknowledging the importance of microwave sensors and their inherent sensitivity to above ground biomass, the potential of Synthetic Aperture Radar for global scale biomass inventories should be investigated (joint activity with WG VII/6 Radar Applications)

WG VII/5 also aims to identify remote sensing sensor and data requirements to support retrieval of other parameters relevant to global change, by strengthening collaboration with organizations and programs involved in global change research. The significance of human activities and monitoring of such - in the global change context - will also be accounted for.

The availability of global scale data and the handling of global databases will be addressed as a joint activity with WG IV/6 (Global databases supporting environmental monitoring).

Accomplishments of ISPRS WG VII/5 during 1998

The activities of the WG were during 1998 focused on the Commission VII mid-term symposium in Budapest, where 5 sessions were arranged under the leadership of former Chair Dr.Shintaro Goto.

Sessions on "Global change and monitoring" and "Regional monitoring" high-lighted global change issues and monitoring of related parameters at global and regional scales. A session on "Studies on urbanization" focused on the use of remote sensing techniques for monitoring of human activities, while a session on "Forestry and agriculture" presented on-going global/regional scale programs and projects (LBA, GRFM/GBFM, L-Pathfinder, TREES and SIBERIA) where remote sensing data constitute important sources of information.

Proposed Future Working Group Program and Workshop Planned for 1999

During the autumn of 1999, a special workshop on low frequency microwave sensors is planned in collaboration with WG VII/6. The aim of the workshop will be to assess user needs and technical limitations for utilizing spaceborne low frequency (P-band, VHF and lower) microwave sensors for global biomass estimations. Exact dates and venue for the workshop is to be decided within short. Reflecting the aims of the modified ToR, four dedicated sessions on the concerned topics are currently being planned and proposed for the year 2000 ISPRS Congress in Amsterdam.

Joint IV/6-VII/5 session at the IV/6 Workshop 15-18 November 1999 Honolulu, USA on "Better Direction of Global Environmental Database Development" For more information: Prof.Dr.R.Tateishi, T: +81 43 290 3850, fax: +81 43 290 3857, e-mail: tateishi@rsirc.cr.chiba-u.ac-jp

WG VII/6 - Radar Applications

Chairperson: Dr. Tony Milne

Co-chairperson: Dr. Jürg Lichtenegger

State of Science and Technology of WG VII/6

Activities of the Working Group have been directed towards establishing effective networking between radar application scientists; conducting radar training workshops, particularly in the Asean-Pacific Region, and in providing input into developmental programs for the next generation of radar instruments and platforms.

Strong linkages have been established with the members of the Global Rainforest Mapping Mission (GRFM) sponsored by NASDA and using JERS-1 data; with NASA and the Jet Propulsion Laboratory AIRSAR program and with proposals related to ESA's Earth Explorer Opportunity Mission

Accomplishments of ISPRS WG VII/6 during 1998

Five workshops have been held in the Asian-Australian region in association with the NASA sponsored AIRSAR PACRIM Mission. These workshops were held in 1998 at, 4-6 March Bangkok, 27-29 April Manila, 26-27 July Sydney, 9-14 November Kuala Lumpur and 19-20 November Manila. Each workshop involved 'hands on' image processing and was designed to assist in sharing skills and techniques necessary to address research in seven application areas. These are forestry and vegetation, geology and tectonic processes, interferometry, disaster management, coastal analysis, agriculture, and urban and regional development.

PACRIM2, the proposed AIRSAR Mission to the Pacific Rim countries scheduled for March-May 2000, was launched at a special session of the Asian Remote Sensing Conference held in Manila, 16-20 November 1998.

Thirteen papers were presented by members of the Working Group at the ISPRS Commission VII Symposium on Resource and Environmental Monitoring held in Budapest, 1-4 September 1998. Major themes presented related to vegetation and biomass estimation procedures and thematic extraction from single and multi-band radar imagery.

Proposed Future Working Group Program and Workshop Planned for 1999

Working Group VII/6 is organising a tutorial on Recent Developments in Radar Science and is participating with WG VII/2 in Applications of Remote Sensing and GIS for Sustainable Development, Workshop on Disaster Monitoring, in Amsterdam 2000. It is also co-sponsoring with WG VII/5 a Workshop on Spaceborne Low Frequency Microwave Sensors for Global Biomass Estimation. Technical Sessions at the main Congress will focus on radar applications in renewable resource monitoring.

WG VII/7: Non-renewable Resources and Geotechnical Applications

Chairperson: Dr. Tshehaie Woldai

Co-chairperson: Dr. James V.Taranik

Accomplishments of ISPRS WG VII/7 during 1998

Working Group VII/7 has arranged two sessions at the ECO BP '98 Symposium in Budapest. The first session was devoted to the topics related to data integration and geotechnical application of remote sensing, the second one focused more on geological application of remote sensing. The presentations covered assessments in valley areas, underground water exploration, landslide monitoring, investigation of neotectonic and earthquakes activities, mineral exploitation etc.

Recommendations passed during the Workshops and meetings held by the ISPRS WG VII/2 and VII/7 clearly demand the importance of this topic "Environmental impact analysis of mining areas" to be considered in the ISPRS 2000 Congress. Both the developed and developing countries are affected by mining induced environmental problems. 130 million people by coal fire in China, 40 million by similar problem in India. The impact of mining in the environment affects countries in Russia, Germany, Spain, Hungary, Czech Republic, Slovakia, Philippines, USA, Canada and others. A special conference of the NATO Advanced Studies held in Hungary, 6-9 September, 1998 has managed to bring around 100 experts from 39 countries to discuss this topic under the chairmanships of Prof. Dr. Andrea Fabbri (ITC, Enschede, The Netherlands), Dr. Gabor Gaal (partner country, Hungary) and Dr. Richard B. McCammon (USGS, USA). The participants unanimously agreed that the impact of mining on the environment is too big to be disregarded and recommended all participants to work on this problem. Major research and collaboration programs were proposed on topics such as impact of mining, environmental impact modeling and site assessment, RS, GIS, data fusion and integration, modeling, hazard zonation (seismic hazards, landslide hazards, mountain hazards), risk assessments, sensitivity analysis-topics which can be used as keywords. Ecological assessment of reclamation

activities, monitoring of long term development of these areas. Change in the socio-economical structure in an area, especially in open cast mining region. Additional subjects to be covered: toxic waste and their impact to health, groundwater pollution, soil degradation, environmental geoindicators and geindices, air, water and soil pollution as a result of mining, mining induced urbanisation, illegal mining, assessment of lowering the groundwater - influences to the ecosystems in the surrounding, mineralogical classification of the tailings and spoiled sediments, assessments of the acid mine drainage, influences to the surface waters, hydrochemical analysis of the lakes etc.

Proposed Future Working Group Program and Workshop Planned for 1999

The main topics in the preparation of the WG VII/7 for the ISPRS Congress will be related to Remotely sensed data and GIS applications in non-renewable resources management; Field data capture techniques, data fusion and modelling; Risk assessment; Geological hazard zoning and mapping (volcanic, seismic); Mountain hazards; RS and GIS in environmental geological applications; Synergy of remotely sensed data; Predictive modelling in geomorphology for environmental impact analysis; Geoenvironmental modelling; Integration of airborne and spaceborne RS data including hyperspectral data; Geophysical and geochemical assessment in mineral exploration; Development of software dedicated to resources management; The role of the satellite industry, software developers etc. versus the end user in the year 2000. Invited co-operating ISPRS WGs: VII/2, VII/3 and VII/6. Co-operating organisations/institutions planned: ITC - Geological Survey Division, MAFI and others.

Additionally, special emphasis will be given to the theme mining and its impact on the environment i.e.the applicability of remote sensing and GIS for sustainable development in environmentally sensitive mining areas. This theme includes: Modelling of mining impacts and site assessment, Field data capture and fusion techniques in environmental impact assessment, Mining induced environmental problems (seismic, Landslide, flood hazards, toxic wastes, tailings and spoiled sediments, soil degradation etc.), Risk assessments, sensitivity analysis, Toxic waste and their impact to health (Medical Geology), Ecological assessment of reclamation activities and monitoring of long term development in a mining areas. Groundwater, soil and air pollution

Mining induced urbanisation. Legal/Illegal mining and its influences to the ecosystem, Acid mine drainage and its influences to the surface waters.

Involved organisations: ITC-Geological Survey Division, UNESCO, World Bank Section of Mining, UNEP, Carl Duisberg Gesellschaft (CDG), Germany, Martin-Luther University Halle-Wittenberg, MAFI etc.

Invited co-operating ISPRS WGs: VII/2, VII/3, VII/4, VII/5 and VII/6.

The WG VII/7 Workshop in 1999 is still open.