1995 Annual Report - Technical Commission VII "RESOURCE AND ENVIRONMENTAL MONITORING"

Dr. Roberto Pereira da Cunha, Commission VII President
Ms. Monica Aparecida de Oliveira, Commission VII Secretary
(BRAZIL)

TERMS OF REFERENCE

- Methodology of visual image interpretation
- Methodology of computer-aided analysis of sensor data
- Spectral, spatial and temporal radiation properties of objects
- Environmental studies, resources inventories, and interpretative aspects of thematic mapping as applied in studies of vegetation, forestry, agriculture, soils, land and water use, geology, geomorphology, hydrology, oceanography, coastal zones, snow and ice, atmospheric sciences, archaeology, human settlements and engineering
- Integration of remote sensing and GIS techniques for the monitoring of resources and environment

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ACCOMPLISHMENTS OF COMMISSION VIIv DURING 1995

Major activities since the mid-term Symposium include the distribution of the **Proceedings of the "ISPRS Commission VII Symposium: Resource and Environmental Monitoring"** in three Volumes containing 1106 pages. In 1995, Commission VII received and attended to several letters requesting copies of the Proceedings. The Proceedings were also shipped to RICS Books, the ISPRS distributor located in the United Kingdom.

During 1995, the Commission prepared and produced two special publications on ECO-RIO'94 Commission VII Symposium. One consisted of a special SELPER Newsletter with the highlights of the Symposium and the other consisted of a special **SELPER Journal** with selected and missing papers of the Symposium. Those publications were sponsored by ISPRS Commission VII and printed with thanks to the support of SELPER Editor Mauricio Araya from Chile. SELPER, the Latin American Remote Sensing Society is a Regional Member of ISPRS.

During 1995, Commission VII activities also concentrated on the promotion of the XVIII ISPRS Congress to be held during 9-19 July 1996 in Vienna, Austria. For this major Congress, the Commission VII prepared a special color poster. This poster was initially distributed at the WG VII/1 and EARSeL International Colloquium on "Photosynthesis and Remote Sensing," which was held 28-31 August 1995 in

Montpellier, France. The poster displays the major remote sensing satellites and their respective spectral bands as well as announcing the ISPRS Congress and its major deadlines. These posters were also distributed during the 5-10 November 1995 "VIIth Latin American Remote Sensing Symposium" organized for SELPER in Puerto Vallarta, Mexico. About one thousand copies of the poster have been mailed to different organizations and individuals worldwide.

COMMISSION VII NEWS

The Commission VII has been working on preparations for the XVIII ISPRS Congress in Vienna. A total of 207 papers have been received to-date, with the following break down by Working Group (WG): WG VII/1 - 35; WG VII/2 - 25; WG VII/3 - 36; WG VII/4 - 27; WG VII/5 - 50; WG VII/6 - 25; WG VII/7 - 17; WG VII/8 - 20; WG VII/9 - 18; WG VII/10 - 14.

There are several news items for the year 1995 for Commission VII, however I would like to register only two highlights from Sï¿½o Josï¿½ dos Campos, SP, Brasil.

- The first is that Commission VII Secretary, Ms. Mï¿½nica has got married, however she says she will still keep her artistic name "Monica de Oliveira."
- The second news is that Maria Langwinski has also joined us in Commission VII and will help us with the activities.

WORKING GROUP ACTIVITIES DURING 1995

- **WG VII/1 - "Physical Measurements and Signatures in Remote Sensing"**

  by Chairman:Dr. Gï¿½rard Guyot (France)
  Secretary:Dr. Thierry Phulpin (France)

  State of Science & Technology of WG VII/1 Topics

  The state of Science and Technology of WG Topics is presented in the conclusions of the Montpellier's Colloquium (pages: 489-496)

  Accomplishments of WG VII/1 During 1995

  The WG VII/I has organized jointly with EARSeL, the International Colloquium "Photosynthesis and Remote Sensing" in "le Corum", the Congress Centre of Montpellier, France from 28 to 30 August 1995. It was a satellite colloquium of the "10th International Photosynthesis Congress" and was supported by:

  - Agence Franï¿½aise de I'Espace (CNES, France)
  - European Commission (JRC ISpra, Italy)
  - Institut National de la Recherche Agronomique (INRA, France)
  - Institut Franï¿½ais pour l'Exploitation de la Mer (IFREMER, France)

- National Aeronautics and Space Administration (NASA, USA)

The Colloquium was also sponsored by the following scientific societies:

- Association Quebeï¿½oise de Teledetection (AQT)
- Canadian Remote Sensing Society (CRSS)
- The Remote Sensing Society (RSS, United Kingdom)
- Sociï¿½tï¿½ Franï¿½aise de Photogrammï¿½trie et de Teledetection (SFPT)

The aim of the Colloquium was to open up discussion and the exchange of ideas between specialists in remote sensing and those in photosynthesis. Its objective was also to establish a dialogue between the two communities of scientist interested both in the activity of oceanic and terrestrial phytomass. This Colloquium thus allowed the evaluation of the state of the art and perspectives for the combined use of remote sensing data and ecosystem functioning models for:

- estimating photosynthesis and net primary production of natural terrestrial and oceanic ecosystems;
- estimating agricultural and forest production with special attention to the distribution of assimilates;
- developing predicative models taking into account biosphere-climate interactions.

The scientific program was organized about five different scientific topics:

- Specificity and points in common of the marine and terrestrial phytosphere;
- New means of characterizing the state of the photosynthetic apparatus;
- Determination of photosynthetic activity using remote sensing;
- Models of photosynthesis and net primary production for the marine and terrestrial phytospheres; and
- The assimilation of remote sensing data within models.

The objective of the Colloquium was to highlight methodological developments rather than applications. This is why most papers were presented in interactive poster sessions rather than parallel sessions. Each plenary session was reserved for a limited number of papers (3-5), to allow enough time for presentations and discussions.

The Colloquium gathered 142 participants representing 24 countries. It lasted three days, with six plenary sessions (26 papers presented) and four interactive poster sessions (52 papers presented). In addition, at the end of the second day, a plenary discussion was organized on the integration of remote sensing data within models, and at the end of the third day, the Colloquium was closed with a general concluding session.

To increase the interest and efficiency of interactive poster sessions, each was introduced by the chairpersons, at the end of the preceding plenary session. This introduction gave, in 15 minutes an overview of the several presentations,

based on overhead transparencies (one per poster) prepared by the authors. Moreover the presentations were systematically mixed in order to have in one session less than five presentations relative to a given subject to allow enough time for the exchanges and discussions with the interested participants.

The Colloquium also included an exhibition of field instrumentation for radiometric and photosynthesis activity measurements.

The proceedings are under preparation and will be available around 15 December 1995. Only 62 contributions presented in both plenary and interactive poster sessions are published (520 pages) because of the strict deadline for submitting the papers for having the proceedings within less than three months after the conference.

The concluding statements presented during the general concluding session are placed at the end of the proceedings. They emphasize the key of thepresentations and outline recommendations for future research programs.

WG VII/1 News

The WG VII/1 plans to organize the "7th International Symposium on Physical Measurements and Signatures in Remote Sensing" are underway. It will take place in the French Alps, in the beginning of 1997 with the support of:

- CNES; (JRC Ispra, Italy); INRA; Deutsche Forsch-ungsanstall fï¿½r Luft und Raumfahrt (DLKR); European Space Agency (ESA); NASA; IFREMER; and, Centre National de la Recherche Scientifique (CNRS).

The Symposium will also be sponsored by the following scientific societies:

- EARSeL; AQT; CRSS; RSS; and SFPT.

This symposium is a continuation of the series of six symposia organized since 1981 by the ISPRS WG VII/1 on "Physical Measurements and Signatures in Remote Sensing". It will focus on the following topics:

- analysis of the relationships between the specific properties of a target (plant canopies, soils, rocks, water bodies, snow, ice,...) and its spectral characteristics in different spectral domains (from ultraviolet to microwaves);
- determination of the factors affecting the spectral response of an object (atmospheric affects, measuring techniques,...); and
- development of interpretation models.

Such research activities are essential for any studies related to remote sensing and is of interest for any specialist involved in large range of applications: physicists, agronomists, foresters, geologist, hydrologists, oceanologist, etc.

The Symposium will also include an exhibition of radiometric and related ground measurement equipment including instruments available on the market

and prototypes developed by research laboratories. It will be completed by a display of scientific books recently published.

The success of these symposia can be measured by the growth of the number of submitted papers, entailing a more and more severe selection (more than 40% of the paper were rejected for the last WG VII/1 Symposium held in Val d'lsere) while the number of participantsincreased from 220 to 310 (24 countries represented). This Symposium has become during the past years one of the major international scientific meeting in the domain of the research in remote sensing and it provides a valuable overview of current research on earth resources and environmental monitoring. However, the increasing audience was seen as limiting one of the specific characteristics of the first meetings, that was to facilitate exchanges and discussions among participants. Therefore, it has been decided to limit the number of participants to about 200, presumably leading to a more severe selection of the submitted papers.

The presentations will cover the following points relative to the whole spectral range covered by remote sensing instruments (short wavelengths, thermal infrared, microwaves):

- Data pre-processing: calibration and intercalibration, correction algorithms for instrumental, atmospheric, directional and topographic effects;
- Simulation of space data, physical modelling and sensitivity analysis;
- Retrieval of bio-ge-physical and chemical parameters: empirical approach (vegetation indices,etc.), inverse problem;
- Utilization of remote sensing data: assimilation into models, spatial and temporal approaches, synergy among several observation methods.

In addition, two evening sessions with general presentations and discussions will be organized:

- Scientific results of large international programmes: IGBP, WRCP;
- Assimilation of remote sensing data within meteorology and agrometeorology applications (discussion of concrete examples).

The Symposium will highlight methodological developments rather than applications, in order to ease scientific exchanges and discussions. It will consist of eight plenary sessions allowing about 30 papers plus seven interactive poster sessions with 15 papers each. The total number of papers being limited to 135, a selection will be done by the International Scientific Committee.

Each half will consist in a plenary session followed by an interactive poster session. The Symposium will end with a general concluding session prepared by the chairpersons and rapporteurs of each session. The concluding statements will emphasize the key points of the presentations and outline trends in future research program. The proceedings will be published soon after the Symposium (less than three months).

- **WG VII/2 - "Resource and Environmental Monitoring Using Radar Data"**

  by Chairman:Hiroyuki Wakabayashi (Japan)

  State of Science & Technology of WG VII/2 Topics

  - *Research Progress*

    The land surface changes, such as the growth of crops, the change of soil wetness and so on, have been successfully detected using multi-temporal SAR data. Using temporal change of backscatter, better classification accuracy of land cover is expected. The land level change caused by the Kobe earthquake could be detected by the JERS-1/SAR data using a differential interferometry technique. The spaceborne SAR data proved to be a powerful tool to find out the change of land surface condition as well as land level.

  - *New Available SAR data*

    The ERS-2, a successor of the ERS-1, was launched in April 1995 and has the identical C-band SAR as on board the ERS-1. During the period from August 1995 to May 1996, the ERS-1 and ERS-2 will be in tandem operation mode. The RADARSAT was launched in November 1995. Its on board C-band SAR has a unique feature that can change the elevation beam angle. Since frequent SAR data and interferometry data sets can be acquired by these satellites, much progress for resource and environmental monitoring is anticipated.

  Accomplishments of WG VII/2 During 1995

  A home page for WG VII/2 in the World-Wide-Web (WWW) is now under construction. It will contain sensor characteristics for the current and planned radars; potential application fields; and recent research results in environmental and resource monitoring. This home page will open to the public in early 1996.

  WG VII/2 News

  For the activities of WG VII/2 in 1996, a special radar session is planned in the "Earth Observation Research Center Symposium", which will be held in Tokyo, Japan.

- **WG VII/4 - "Geological and Mineral Resources"**

  by Chairman:Dr. James V. Taranik (USA)
  Co-Chairman:Dr. Alvaro Crï¿½sta (Brazil)
  WG Members: 18

  State of Science and Technology of WG VII/4 Topics

  - *Landsat*

Currently Landsat-5 continues to acquire data and the U.S. Government has made a commitment to fly an Enhanced Thematic Mapper-Plus on Landsat-7.

Plans are now underway to define a Landsat-8 payload for the EOS AM-2 satellite to be launched in 2006. These plans may include development of an operational hyperspectral sensor that will also provide Landsat-TM data for data continuity.

- *SPOT*

  The French SPOT program continues to post successes with the successful launch of SPOT-3 and approval of funding for SPOT-4 and SPOT-5.

- *JERS-1*

  The Japanese JERS-1 program has successfully acquired both optical and synthetic aperture radar of much of the Earth's land surface. A follow-on JERSS radar imaging satellite is planned for launch in 2000 which will have electronic beam steering and multiple frequencies.

- *Commercial Programs*

  Several commercial programs in the United States propose to acquire 1-meter to 3-meter spatial resolution data and 3 to 5 meter global multispectral stereoscopic data (CTA-Clark, Earth Watch, Orbview, etc.). These satellite systems could allow geoscientists to develop digital terrain data at 1:50,000 scale with 10 meter contours for the entire land surface of the earth.

- *Indian Space Program*

  The Indian Space Program has developed a series of operational satellites (IRSS) for natural resources management.

- *Hyperspectral Imaging*

  NASA recently selected TRW to provide a Hyperspectral Imager (HSI) with 384 spectral bands at 30 meter spatial resolution on the Lewis spacecraft as part of the Small Satellite Technology Initiative (SSTI). Hyperspectral imagers are being developed in the United States, Europe and Japan that show promise for improving mineral and petroleum detection. One such sensor, the Hyperspectral Digital Imaging Collection Experiment (HYDICE) is now acquiring 210 spectral bands in the visible and reflected infrared, with 3 meter spatial resolution over a 1 kilometer swath from aircraft flight heights of 6000 meters.

- *Thermal Mappers*

Multiband thermal emission mappers have been developed for flight in aircraft which show greatpromise for geologic and mineral resources applications. Japan, with the assistance of NASA, plans to fly a multiband thermal mapper as a part of the ASTER payload on EOS AM-1 by the end of the decade. The U.S. Department of Energy is proposing to develop a Multispectral Thermal Imager for flight on a dedicated small satellite. The MTI would have 10 VNIR-SWIR bands with 5 meter spatial resolution, 2 bands in the 3-5 um region with 40 meter spatial resolution and three bands in the 8-14 um spectral region with 40 meter resolution.

- *Space Radar Systems*

  The United States and Germany successfully flew Space Radar Laboratory-1 on the Shuttle in 1994 and acquired 2000 Gigabytes of three frequency/four polarization imaging radar data over 30 percent of the Earth's surface. The Canadian Radarsat program successfully launched a C-band imager (Radarsat) on 4 November 1995. Future plans for microwave sensors include the development of SAR interferometry and polarimetric SAR.

Computer technology has now rapidly evolved to place robust desktop workstations and laptop computers easily within the reach of individual consulting geoscientists working in remote areas of the world.

Airborne geophysical remote sensing (airborne magnetics, gravity and electromagnetic) are being successfully analyzed in conjunction with aerospace remote sensing data, and ground geoscience information, using geographic information systems technology for mineral exploration in poorly mapped, remote areas.

Software developments now include automated neural network, n-dimensional classification, constrained energy minimization, convex geometry, spectral mixture analysis, etc., for hyperspectral analysis.

Global position system data has revolutionized exploration and geotechnical investigations in remote areas. Cellular telephone technology now allows geoscientists to transmit information data from the most remote areas of the world.

WG VII/4 News

ISPRS WG VII/4 will hold a workshop on 29 February 1996 at the Eleventh Thematic Conference on Applied Geology Remote Sensing "Practical Solutions for Real World Problems", in Las Vegas, USA. Dr. Taranik, Chairman of WG VII/4 is the Master of Ceremonies for the Conference which will present over 60 plenary papers, 231 poster papers, six workshops and five field trips.

On 18 July 1995, the WG Chairman presented a summary of state of the art in Geologic and Mineral Resources Remote Sensing the annual meeting of the

Energy Minerals and Environment Divisions of the American Association of Petroleum Geologists, cordilleran section meeting in Sparks, Nevada, USA.

- **WG VII/5 - "Terrestrial Ecosystem Monitoring"**

  by Chairman:Prof. Paul Curran (United Kingdom)
  Co-Chairman:Dr. Ake Rosenqvist (Japan)

  State of Science and Technology of WG VII/5 Topics

  The WG uses remotely sensed data to further under-standing of terrestrial ecosystems at local to global scales. The activities promoted, discussed and presented by the WG encompass research involving all remotely sensed data and ecosystems where the goal is to understand ecosystem function rather than to know ecosystem characteristics or to manage ecosystem change.

  Accomplishments of WG VII/5 During 1995

  The WG organized a very successful meeting in conjunction with the Remote Sensing Society of the University of Southampton during 11-14 September 1995. There were 340 registered (a quarter from outside the UK) and the theme of the ISPRS sessions was the remote sensing of vegetation and land cover. The proceedings were published at the time of the meeting: Curran, P.J. and Robertson, Y.C. (Editors), 1995, **ESS '95 Remote Sensing in Action** , Remote Sensing Society, Nottingham, 1359pp, (ISBN 0 946226 20 2).

  WG VII/5 News

  There will be two WG VII/5 sessions at the XVIII ISPRS Congress in Vienna, Austria, 9-19 July, 1996.

- **WG VII/7 - "Hazardous Waste & Environmental Pollution"**

  by Chairman:Dr. Vernon Singhroy (Canada)
  Co-Chairman:Dr. Charles Nalezny (USA)
  WG Members: 8

  State of Science & Technology of WG VII/7 Topics

  - *Development of Remote Sensing (RS)/GIS Techniques to Monitor the Effects of Large Scale Pollution:*

    Biomass Burning Emissions in the Cerrado of Brazil Using RS/GIS - (Agency: ANSA)

    Ozone Air Pollution on Canopy Reflectance (Agency: INPE)

  - *Environmental Site Characterization from RS/GIS Techniques in Relation to Site Rehabilitation*

Environmental Restoration Techniques in the U.S. (US Dept. of Energy)

Remote Sensing Techniques to Detect the Effects of Mininguin Canada (CCRS).

- **WG VII/8 - "Snow, Ice, Ocean & Coastal Zone Monitoring"**

by Chairman:Dr. Shintaro Goto (Japan)
Co-Chairman:Dr. Katsumoto Seko (Japan)

State of Science & Technology of WG VII/8 Topics

- Monitoring the 2-dimensional wave distribution practically by using microwave remote sensing technics
- Constructing GIS for marine environment
- Glacier-ice-sheet monitoring by microwave remote sensing

Accomplishments of WG VII/8 During 1995

- Participated in the "Third Thematic Conference Remote Sensing for Marine and Coastal Environment" 18-20 September 1995 in Seattle, USA, to establish a dense human network. Held a planning meeting there for scheduling the WG VII/8 Workshop in November 1995.
- Expect a successful WG VII/8 "International Workshop on Remote Sensing for Coastal and Marine Engineering" during 17-18 November 1995 in Hiroshima, Japan. (This report was submitted before the event date - see below.)

WG VII/8 News

The planned ISPRS WG VII/8 "International Workshop on Remote Sensing for Coastal and Marine Engineering," to be held 17-18 Nov 1995 in Hiroshima, Japan is sponsored by the ISPRS WG VII/8 and the Japan Society of Photogrammetry and Remote Sensing with support of the Japan Coastal Engineering Association.

The following Sessions and speakers are planned:

- "Remote Sensing for Coastal Environment"
  Yasuhiro Sugimori, Japan
- "Microwave Remote Sensing for Sea Surface Monitoring"
  Hisashi Mitsuyasu, Japan; Gordon Staples, Canada
- "Monitoring Sea Surface Wave Field"
  Yoshiyuki Kawata, Akihiro Yamazaki, Japan; F. Ziemer, Germany; Shintaro Goto, Kiynori Iisawa, Japan
- "Geomatics for Marine and Ocean Environment"
  Katsutoshi Kozai, Japan; Yukio Akamatsu, Naoki Shirai, Tadashi Asai, Kazuo Murakami, Japan; Ren Jinsong, Tong Yu, Chen Hedong, China; Tsukasa Nishimura, Tomonao Kobayashi, Sotaro Tanaka, Toshiro Sugimura, Yuji Hatakeyama

- "Monitoring Sea Surface by HF Radar"
  Sei-chi Saitoh*, kazuhiko Kasuga, Hiroji Onishi, Yutaka Isoda, Hideo Miyake, Akitugu Nadai, Satoshi Fujii; Akitsugu Nadai, Japan; Shinichi Sakai, Masafumi Mizutori, Hiroshi Kuroiwa, Akitsugu Nadai
- "New Sensor - Monitoring Sea Surface by Interferometric SAR"
  John W. M. Campbell, A. Laurence Gray, Karim E. Matter, Canada
- "Discussion Session"
  - What is the point of contact of remote sensing & GIS technologies and coastal & marine engineering?
  - Example of Marine Radar Application in Germany
  - Example of RADARSAT Application in Canada
  - What can remote sensing do for coastal & marine engineering?
  - What is the necessary specification of remote sensing data in terms of spatial and temporal resolution for coastal remote sensing?
  - SAR data
  - HF radar
  - Marine radar
  - Optical sensor
  - GIS

- **WG VII/9 - "Human Settlement"**

  by Chairman:Dr. Bruce Forster (Australia)
  WG Members: 4

  State of Science & Technology of WG VII/9 Topics

  With the rapid growth of urban areas, particularly in developing countries, there has been a rapid increase in the demand for urban information to satisfy the needs of urban planners and decision makers. Satellite remote sensing is being increasingly used for this purpose. With the greater availability of synthetic aperture radarsatellite systems, a number of researchers are examining backscatter modelling of urban areas, to enable all weather information to be acquired. Increasingly urban remote sensing and urban GIS are being seen as two parts of the whole, of data acquisition and analysis. Over the next two years a number of companies are proposing to launch satellite systems with one to four meter pixel resolution, and turn-around periods of two to three days. This will have a tremendous impact on data gathering for human settlements.

  Accomplishments of WG VII/9 During 1995

  A major accomplishment has been the development of an extensive network of researchers involved in remote sensing of human settlements. As researchers and practitioners come from many and varied backgrounds this is a difficult task. This task is continuing.

  A number of WG members are contributing to the writing of a Volume on remote sensing of human settlements for the ASPRS Manual of Remote Sensing. The Chairman of WG VII/9, Professor Bruce Forster, is volume Editor.

Working VII/9 News

Paper presentations to the Vienna Congress are being widely encouraged.

- **WG VII/10 - "Global Monitoring"**

  by Chairman:Dr. Sergio Camacho (United Nations)
  WG Members: 8

  State of Science and Technology of WG VII/10 Topics

  As three fifths of the land area and nearly all tropical regions of the world, with the bulk of the global biodiversity, is in developing countries, the WG considers it very important to promote a more active participation by these countries in studying and understanding the global environment and its resources scientifically.

  Through activities of some of the institutions of the WG members, the WG conducted a survey on the participation of developing countries in Global Change. The work began in 1994 and continued in 1995. Through workshops and meetings organized by the United Nations and the European Space Agency (ESA), the survey gathered and disseminated information on the factors that limit the participation of developing countries. The results of the survey have been described in a United Nations study entitled "Global Change: Participation of Developing Countries and Possibilities of Enhancing It" (document A/AC.105/590) presented tothe United Nations Committee on the Peaceful Uses of Outer Space (COPUOS) in 1995. The survey also compiled information on activities by space agencies that could facilitate the participation of developing countries, such as the link between CEOS and IGBP-DIS.

  The trend observed was that low awareness of the value of participating in Global Change among decision-makers; and economic limitations and limited access to regional and global databases, were the main factors for low participation of developing countries. Scientific groups are highly sensitive to political and economic instabilities and have a tendency of partially or completely disintegrating under such circumstances. The study concluded that stronger technical cooperation within and outside regions could alleviate this situation. It is also necessary to promote the Global Change program among governments since outside of universities, most agencies that can conduct research and support applications are in that sector.

  The study indicated that there are data accessibile on-line and at no cost through the Internet and listed space agencies which have offered to provide images at discounted prices for global change research.

  Accomplishments of WG VII/10 During 1995

  The study entitled "Global Change: Participation of Developing Countries and Possibilities of Enhancing It" was distributed at the workshop, conference and training course identified below to 129 participants from 44 developing

countries from all regions. These meeting activities served as a forum for the participants to attend scientific presentations on monitoring of the environment, and to hold discussions about the factors which limit the participation of developing countries, and to discuss actions which could facilitate such participation. Summaries of the discussions and recommendations of these activities have been published in United Nations document A/AC.105/612, 613 and 622 which will be presented to the Scientific and Technical Subcommittee of COPUOS in February 1996.

- *UN/ESA Training Course on the "Use of ERS-1 Data for Mapping and Inventory of Natural Resources in Africa*," Libreville, Gabon, 15-20 May 1995.
- *UN/IAF Workshop on "Space Technology for Health Care and Environmental Monitoring in the Developing World*," Oslo, Norway, 28 September-1 October 1995.
- *UN/ESA Regional Conference on "Space Technology for Sustainable Development and Communications*", Puerto Vallarta, Mexico, 30 October-3 November 1995.

WG VII/10 News

WG VII/10 is working with ESA and other institutions to establish a dedicated server for electronic mail that will interconnect space scientists from Latin America and the Caribbean; a bulletin board of this service will be dedicated to Global Monitoring of the environment and will provide referrals to data and information sources as

well as a medium to exchange experiences. The WG will also explore the possibility of joining on-going efforts (e.g. MERCURE and COPINE) or to establish an independent server to extend the service to other regions in the developing world. The WG hopes to be able to report on this initiative during the XVIII Congress of ISPRS in July 1996.