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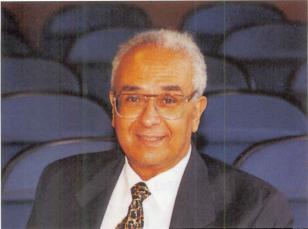
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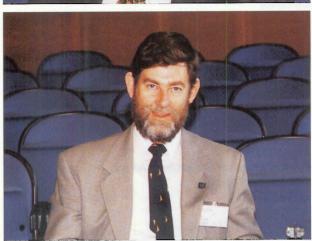
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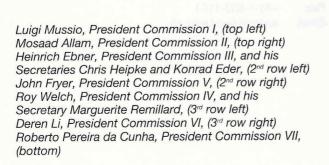














# ISPRS TECHNICAL COMMISSIONS AND WORKING GROUPS COMMISIONS TECHNIQUES ET GROUPES DE TRAVAIL TECHNISCHE KOMMISSIONEN UND ARBEITSGRUPPEN 1992 - 1996

## COMMISSION I SENSORS, PLATFORMS AND IMAGERY

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#### Commission I: Terms of Reference

o Planning for aerial and space missions

- Design, construction, testing, installation and calibration of analogue and digital imaging sensors
- Design and performance of data reception and preprocessing systems
- Geometric and radiometric properties of image data and quality standards and factors (environmental and others) affecting data quality
- Technical systems for recording sensor data, film scanners and auxiliary data (time, position, attitude, etc.) and media (film, magnetic, optical, etc.)
- Preprocessing techniques to generate datasets suitable for analysis and measurements (radar image synthesis, multisensor integration, radiometric and geometric corrections, etc.)

# WG I/1: Image Data Quality Control Assessment and Standardization

Chairperson:

Prof. Dr. Hartmut Ziemann, Germany

#### WG I/1: Terms of Reference

- Survey of image quality parameters used by manufacturers and users of different kinds of imaging devices with an attempt to relate these parameters to each other
- Establishment of contacts with organizations involved in the standardization of imaging devices and components used in imaging such as ISO, IEC, SPIE and CIE
- Maintenance of contacts to the CEOS Working Group on Calibration and Validation

 Evaluation of the usefulness, actual use and technical content of the Recommended Procedures and the Specifications, e.g., through a Survey of ISPRS member societies

# WG I/2: System Aspects of Platform Guidance, Navigation and Sensor Positioning

Chairperson:

Dr. Petros Patias, Greece

#### WG I/2: Terms of Reference

- Study high precision navigation systems and their role in Photogrammetry and Remote Sensing
- Investigate accuracy requirements in measuring the exterior orientation elements in various levels of application
- GPS and INS systems for platform guidance and sensor orientation and positioning
- Establishment of contacts with WG III/1 and other scientific organizations (IUGG, IAU) involved in these areas

#### WG I/3: Optical Digital Imaging Sensors

Chairperson:

Dr. Hans-Gerd Maas, Switzerland

#### WG I/3: Terms of Reference

- Survey recent and future developments in digital image sensors
- o Analysis of the performances of spaceborne and airborne sensors for the range of optical wavelengths
- Investigate geometric and radiometric characteristics of digital image sensors including procedures for calibration of digital sensors
- Establishment of contacts with WG V/2

### WG I/4: Microwave Imaging Sensors and Preprocessing

Chairperson:

Prof. Claudio Prati, Milano

### WG I/4: Terms of Reference

o Development of new technologies and techniques in microwave sensor design, development and operation

- including interferometric, polarimetric and bistatic multifrequency SAR systems
- Promote new developments in SAR signal preprocessing, including algorithms, architectures and operations
- Assessment of an end-to-end radiometric calibration procedure of microwave imaging systems including error analysis and error reduction techniques
- Establishment of contacts with Working Group VII/2 and others interested in innovative applications of the microwave imaging technology or its signal data to environmental, land use, mapping or other relevant issues

# WG I/5: Hardcopy Scanning & Preprocessing Systems

Chairperson: Prof. Ralf Bill, Germany

#### WG I/5 - Terms of Reference

- Refine a mathematical description of integrated data acquisition systems. Establishment of testing procedures and standards for quality check for new sensor types
- Analysis of the requirements of integrated data acquisition systems; data amount and data rate evaluation; comparison of data storage and data reduction methods
- Investigation of the potential of integrated data acquisition systems for multi-media GIS
- Establishment of contact with IC WG's II/III and III/IV and setting up an interdisciplinary research team with candidates from surveying, electrical engineering, computer science and other disciplines

# WG I/6: Preprocessing and Archiving of Satellite Data for Remote Sensing

Chairperson: Dr. Dan Rosenholm, Sweden

#### WG I/6: Terms of Reference

- Investigation of the geometric and radiometric characteristics of analogue and digital spaceborne imaging systems
- Study methods and systems for spaceborne analogue and digital data archiving
- Study and assessment of methods and systems for spaceborne sensors analogue and digital data preprocessing
- o Performance of the current and planned satellite platforms and sensors

#### **COMMISSION II**

# SYSTEMS FOR DATA PROCESSING, ANALYSIS AND REPRESENTATION

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#### Commission II: Terms of Reference

- Design and development of integrated for measurement, processing, analysis, representation and storage of photogrammetric, remote sensing, and GIS data
- Study and evaluation of system integration aspects for photogrammetry, remote sensing and GIS data processing
- o Analysis of systems and their components for automated, semiautomated and manual digital processing systems
- Development of systems and technologies for radar data processing
- Study of real-time mapping technologies
- Standardization of digital systems for photogrammetry, remote sensing and GIS

## WG II/1: Real-Time Mapping Technologies

Chairperson: Dr. Kurt Novak, USA

#### WG II/1: Terms of Reference

- Design and development of integrated real-time mapping systems, e.g. for utility mapping and other applications
- o Survey recent and future developments in real-time mapping systems
- o Investigate system aspects related to sensor information processing and analysis issues in autonomous vehicle navigation systems
- Assess the role of stereo-vision and kinematic GPS technologies in integrated real-time mapping systems
- Establishment of contacts with Working Groups of Commission I, II, III and V interested in integrated sensor orientation, GPS-INS integration, object recognition or other relevant issues

#### WG II/2: Hardware and Software Aspects of GIS

Chairperson:

Dr. Manfred Ehlers, Germany

#### WG II/2: Terms of Reference

- Design and operational aspects of the integration of GIS with image analysis systems
- Studies of GIS characterized by workstation, mainframe and microsystems in a heterogenous environment
- Studies of parallel processors, array processors, supercomputers and optical hybrid systems for improving GIS
- o Design and performance issues for 3-D GIS
- o Studies of benchmark designs for integrated GIS
- o Studies of man-machine interaction: display techniques, interactive techniques and audio interaction
- o Hardware and software for input/output aspects of GIS
- Studies of GIS standardization as applied to user interface, networking, testing and databases

# WG II/3: Technologies for Large Volumes of Spatial Data

Chairperson:

Dr. Ekow Otoo, Canada

#### WG II/3: Terms of Reference

- o Raster data formats composition and transmission
- o Vector data format and topological models
- o Spatial data models
- Data base management systems for spatial data in a heterogenous environment
- o High volume storage media
- o High performance I/O subsystems
- o Fractals
- o Cataloguing and data dictionary
- o Data exchange between heterogenous environments

#### WG II/4: Systems for the Processing of Radar Data

Chairperson:

Dr. Robert O'Neil, Canada

#### WG II/4: Terms of Reference

- Development of methodologies to process, analyze and interpret Synthetic Aperture Radar (SAR) data
- Development and validation for SAR imagery acquired by space-borne instruments such as ALMAZ, ERS-1, J-ERS-1, RADARSAT and ERS-2

## WG II/5: Integrated Production Systems

Chairperson:

Dr. Atef A. Elassal, USA

#### WG II/5: Terms of Reference

- The role of GIS, image analysis systems (IAS), remote sensing and photogrammetric technologies in the design of Integrated Production Systems (IPS)
- o Design and development aspects of IPS, including benchmark tests for system evaluation
- o Standards/methodologies for data communication, data exchange, operational data flow and output for IPS
- The development of total digital platforms and spatial information infrastructure for the management of heterogenous corporate databases

# WGII/SPECIAL PROJECT (SP): Upgrading Photogrammetric Instruments

Chairperson:

Dr. Klaus Szangolies, Germany

#### WG II/SP: Terms of Reference

- Survey recent and future developments in analog and analytical photogrammetric systems and identity/classify the various types of add-on devices and/or instrument modification
- Evaluate the impact of upgrading photogrammetric systems with digital devices and computer technologies on the instrument productivity, its life-span and users

# INTERCOMMISSION WG II/III: Digital Photogrammetric Systems

Chairperson:

Prof. Ian Dowman, United Kingdom

## IC WG II/III - Terms of Reference

- o Digital photogrammetric workstation design
- Design issues for computational tasks using parallel processing, multi-processors and task specific architectures
- o Visualization techniques including stereo, spatial, temporal, and animation issues in computer graphics
- o Multimedia techniques for imagery, scanned documents, sound and video
- o Automated cartographic compilation systems (algorithms and system interfaces)
- Integration of photogrammetric techniques and models into computer vision systems for the analysis of remotely sensed imagery
- Integration with input and visualization devices such as image scanners and raster plotters
- o Human-computer (man-machine) interface issues in photogrammetric system design
- o Integration with spatial data bases including digital maps, terrain models and remotely sensed imagery

# COMMISSION III THEORY AND ALGORITHMS

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### Commission III: Terms of Reference

- Algorithms for geometric determination and analysis of photogrammetric data
- Feature extraction from multi-sensor, multi-resolution, multi-temporal imagery
- Image understanding
- o Integrated sensor orientation
- o Image sequence analysis
- Algorithms for digital photogrammetric systems and their GIS integration
- GIS concepts, with particular emphasis on integration of image data

#### WG III/1: Integrated Sensor Orientation

Chairperson:

Ismael Colomina, Spain

#### WG III/1: Terms of Reference

- o Aerial triangulation with GPS aerial control
- Aerial and space triangulation with surface and line information
- Position determination of airborne line and range sensors by kinematic GPS
- Attitude determination of airborne line and range sensors
- Total system calibration
- o Combined/generalized block adjustment
- o Cooperation with WG I/2

# WG III/2: Geometric-Radiometric Models and Object Reconstruction

Chairperson:

Prof. Dr. Kennert Torlegård, Sweden

#### WG III/2: Terms of Reference

- o Geometric and radiometric image formation
- Reconstruction of image orientation, object points, lines and surfaces
- o Perceptual grouping
- o Geometric reasoning
- o Image transformation
- o Image and surface segmentation

## WG III/3: Semantic Models and Object Recognition

Chairperson:

Dr. Toni Schenk, USA

#### WG III/3: Terms of Reference

- Object recognition: model-based methods versus context-based methods
- Knowledge encapsulation, representation and manipulation
- o Hypotheses generation and verification
- o Data structures, interaction with GIS
- Computational modeling

# WG III/4: Tutorials on Theory and Algorithms

Chairperson:

Prof. Fabio Crosilla

#### WG III/4: Terms of Reference

- o Theory of Digital Photogrammetric Systems
- o Advanced topics and future trends in GIS
- o Satellite techniques for positioning and for the production of digital cartography

## INTERCOMMISSION WG III/IV: Conceptual Aspects of GIS

Chairperson:

Prof. Dr. Martien Molenaar

# IC WG III/IV: Terms of Reference

- Object/Space Modeling for GIS
- o Integration of Data from Multi-Sources
- Query Spaces and Analysis of Geo-Objects and Geo-Space
- o Linking Aggregation Levels
- o Handling Uncertainty

# COMMISSION IV MAPPING AND GEOGRAPHIC INFORMATION SYSTEMS

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#### Commission IV: Terms of Reference

- o Analogue and digital mapping procedures and products
- o Revision of topographic maps and map databases
- Data acquisition, data processing, analysis of data and visual representation in GIS
- Application of GIS to land related record management (e.g., multipurpose cadastre and utility mapping) and decision making tasks
- o Radar and planetary mapping
- o Digital elevation models

WG IV/1: GIS Data & Applications

Chairperson: Dr. E. Lynn Usery

#### WG IV/1: Terms of Reference

- o Digital technologies for the integration of photogrammetric and remote sensing data with GIS
- Role of GPS, photogrammetry, remote sensing and digital image processing in the construction and revision of GIS databases
- Status of computer hardware and software for GIS applications
- Methods for applying GIS technology to mapping, planning and natural resource inventory at local, regional and global scales

# WG IV/2: International Mapping from Space

Chairperson:

Prof. Dr. Gottfried Konecny

### WG IV/2: Terms of Reference

o Status & technical definition of remote sensing/mapping

#### satellite systems

- Requirements for international remote sensing/mapping programs
- o International cooperation in global remote sensing/mapping activities
- Accuracy and information requirements for topographic and thematic maps, and for GIS databases generated from satellite imagery
- Techniques for mapping and GIS database construction from satellite image data

### WG IV/3: Map and Database Revision

Chairperson: Paul R. T. Newby

#### WG IV/3: Terms of Reference

- Status of world mapping and requirements/needs for map and database revision
- Detection of changes in cultural detail, natural features and topography from satellite imagery and aerial photographs
- Techniques for the revision of maps and GIS databases, including superimposition of maps and images and the automated detection, extraction and classification of new features
- Hardcopy and softcopy presentation of revised maps and databases

# IV/4: Digital Elevation Models (DEMs) and DIGITAL Orthoimages for Mapping/GIS Applications

Chairperson: Dr. Luiz Alberto Vieira Dias

#### WG IV/4: Terms of Reference

- o Commonly used data structures and DEM formats
- o Applications of DEMs for topographic and thematic mapping, terrain visualization and orthoimage generation
- Use of DEMs and orthoimages for GIS applications
- o DEM data sets for regional, national and global modeling activities

#### WG IV/5: Extraterrestrial Mapping

Chairperson: Dr. Sherman S. C. Wu

# WG IV/5: Terms of Reference

- o Status of plans for extraterrestrial mapping
- Documentation of data sources, mapping techniques and products of current and future activities in extraterrestrial mapping
- Development of new techniques for data acquisition and extraterrestrial mapping

# WG IV/6: GIS and Expert Systems for Global Environmental Databases

Chairperson:

Dr. Ryutaro Tateishi

#### WG IV/6: Terms of Reference

- Global databases for mapping and monitoring natural resources and the environment
- Remote sensing and GIS activities in support of global change research
- Interface of knowledge based systems and GIS for resource inventory

# INTERCOMMISSION WG III/IV: Conceptual Aspects of GIS

Chairperson:

Dr. Martien Molenaar

(SEE COMMISSION III)

# COMMISSION V CLOSE-RANGE TECHNIQUES AND MACHINE VISION

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#### Commission V: Terms of Reference

- o Close-range and microrange measurements
- Recording and monitoring of objects in motion and under deformation
- Optical and integrated close-range sensor systems
- Digital systems and time constrained solutions in closerange applications
- Image analysis and image synthesis algorithms in close-range applications
- Object related processing techniques in automatic, semi-automatic and manual mode in close-range applications

#### WG V/1: Knowledge Based Vision Metrology

Chairperson:

Prof. Kam W. Wong

#### WG V/1: Terms of Reference

- o Universal systems for close range metrology
- o Artificial intelligence technology
- o Human-machine interface design in system automation
- Design for time-constrained solutions
- Interface with spatial information systems
- o Surface modeling and object recognition

# WG V/2: Close-Range Imaging Systems and their Performance

Chairperson:

Dr. Horst A. Beyer

#### WG V/2: Terms of Reference

- o Illumination, structured lighting, targeting
- Image recording systems including all components from optics to storage device (film, solid-state sensors, other imaging techniques) and film scanning systems
- Radiometric and geometric evaluation/ characterization of the complete imaging chain
- Procedures and strategies for calibration and orientation of close-range systems
- Image measurement and object estimation techniques (special algorithms for close-range applications)
- o Performance of such systems under laboratory and industrial conditions regarding accuracy, reliability, stability, speed, price/performance ratio, per se and in comparison to competing techniques (CMM, theodolites, etc.)

# WG V/3: Structural and Industrial Measurements with Consideration of CAD/CAM Aspects

Chairperson:

Dr. Clive S. Fraser

# WG V/3: Terms of Reference

- Integration of CAD/CAM into the photogrammetric measurement process
- Utilization of CAD concepts in interactive network design systems
- Direct interfacing of the photogrammetric restitution process with CAD/CAM
- o Digital photogrammetric systems for industrial mensuration
- Design and implementation aspects of digital systems (time-constrained or otherwise) for use in industry
- The transfer of photogrammetric technology to the industrial design, engineering and manufacturing sector
- Current and future application of close range photogrammetry to problems involved with industrial processes

# WG V/4: Photogrammetry in Architecture and Archaeology

Chairperson: Mr. Cliff L. Ogleby

#### WG V/4: Terms of Reference

- Application of photogrammetry to the surveying, recording and visualization of architectural and archaeological cultural monuments
- Incorporation of new and innovative photogrammetric technology including digital acquisition of imagery, and analytical restitution techniques
- Incorporation of CAD, GIS, modeling and visualization technologies into the recording, management and representation of cultural monuments
- Cooperation with national and international groups such as CIPA
- Actively promote the use of photogrammetry-based recording methodologies to governments, organizations and the community in general

# WG V/5: Biostereometrics and Medical Imaging

Chairperson: Dr. Thomas Leemann

#### WG V/5: Terms of Reference

- o Human motion analysis
- Biological surface measurements: Conventional film and target systems; Electro-optical recording; Nontargeted surface characterization
- o 3D Medical imaging and anthropometry
- o 3D Microscopy
- o Analysis of stereo-vision
- o Hardware and software
- o Presentation and visualization
- o Hardware and software for use in medical photogrammetry

# INTERCOMMISSION WG V/III: Image Sequence Analysis

Chairperson: Dr. Emmanuel Baltsavias

#### IC WG V/III: Terms of Reference

- o Sensors
- o Construction and Representation of Local Maps
- o Fusion of Local into Global Maps
- o Navigation
- o Motion Planning
- o Strategy Aspects
- o Image Sequence Analysis Systems
- o Fusion of multi-sensory information
- Error modeling and propagation of uncertainty
- Use of a priori knowledge from spatial information systems

### COMMISSION VI ECONOMICS, PROFESSIONAL MATTERS AND EDUCATION

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#### Commission VI: Terms of Reference

- Collection, analysis and comparison of educational and training programs and changes in photogrammetry, remote sensing and GIS/LIS
- o Investigation of cost and efficiency models in photogrammetric and remote sensing operations
- o Investigation of operational management aspects for remote sensing and GIS technology
- Collection and synthesis of reports on national and regional activities
- o Promotion and dissemination of information
- o Promotion of computer assisted teaching
- o Identification of the proper channels for international technical cooperation
- o Completion of the History of Photogrammetry
- Promotion of the inclusion of other languages in the Multilingual Dictionary
- Development of recommendations for standards of competence in photogrammetric and remote sensing practice

WG VI/1: Education, Training and Educational

Standards for Photogrammetry, Remote

Sensing and GIS/LIS

Chairperson: Prof. Dr. Jozef J. Jachimski

### WG VI/1: Terms of Reference

- Promotion of education and training for photogrammetry, remote sensing and GIS/LIS, taking into account the particular regional needs
- o Identification of educational standards for photogrammetry, remote sensing and GIS/LIS

- Compilation of ideal syllabi and course layouts for undergraduate education on photogrammetry, remote sensing and GIS/LIS
- Investigation of the possibilities for personnel training through the organization of appropriate workshops

promotion and use of photogrammetry, remote sensing, LIS and GIS

Promotion of the general understanding of our profession, improvement of public relations for our discipline

#### WG VI/2: Computer Assisted Teaching

Chairperson: Dr. Kohei Cho

#### WG VI/2 Terms of Reference

- Collection, analysis and dissemination of materials, software and data (hardcopy and/or softcopy) for computer assisted teaching
- Investigation of the role of computer assisted teaching in modern education and training in photogrammetry, photointerpretation, remote sensing and GIS/LIS
- Promotion of computer assisted teaching in developing countries

# WG VI/3: Terminology and ISPRS Multilingual Dictionary

Chairperson: Dr. Gerhard Lindig

#### WG VI/3: Terms of Reference

- Update the already compiled Multilingual Dictionary (MI D)
- Urge the publication of glossaries derived from the existing MLD's
- Invite further language groups to collaborate with the working group
- Investigation of the possibilities for the standardization of the terminology for photogrammetry, remote sensing, LIS and GIS

# WG VI/4: International Cooperation and Technology Transfer

Chairman: Dr. Stanley A. Morain

### WG VI/4: Terms of Reference

- o Encouragement and organization of the international exchange of information, documentation and research in photogrammetry and remote sensing
- Urge governments, particularly in developing countries, to encourage the use of photogrammetry, remote sensing and GIS/LIS by establishing appropriate facilities
- Standardize the form of National Reports and suggest ways to best evaluate and exploit them
- o Establish connections with international organizations (UN, EEC, ESA, World Bank, etc.) to urge the wider

#### WG VI/5: Tutorials

Chairperson: Dr. Th. Bouloucos

#### WG VI/5 - Terms of Reference

- Spread of new theories and new algorithms concerning photogrammetry, remote sensing, computer vision and GIS/LIS.
- Organization of course and production of lecturing materials and tutorial papers in cooperation with other ISPRS Commissions, sister societies and other organizations
- Investigate the standards and the scientific fields in order to organize as many tutorials as possible by appropriate institutions

#### WG VI/6: Economics and Business Management

Chairperson: Dr. Gérard Bégni

### WG VI/6: Terms of Reference

- Study the economics and business management aspects of photogrammetry, remote sensing and GIS/LIS
- o Investigation and establishment of standards for economics and business management
- o Investigate the impact of 1996 on economics and business management matters of photogrammetry and remote sensing as far as EEC member countries are concerned
- Formulation of management models in geoinformation industry to help the successful introduction and maintenance of GIS/LIS technology

# COMMISSION VII RESOURCE AND ENVIRONMENTAL MONITORING

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#### Commission VII: Terms of Reference

- Methodology of visual image interpretation
- Methodology of computer-aided analysis of sensor data
- Spectral, spatial and temporal radiation properties of objects
- o 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

# WG VII/1: Physical Measurements and Signatures in Remote Sensing

Chairperson: Dr. Gérard Guyot

#### WG VII/1: Terms of Reference

- o All physical measurements and modeling related to Remote Sensing
- Spectral studies of spectral measurements and calibration at different spatial scales
- o Standardization and harmonization of experimental methods and procedures in remote sensing
- o Remote Sensing of the atmosphere

# WG VII/2: Resource and Environmental Monitoring Using Radar Data

Chairperson: Hiroyuki Wakabayashi

#### WG VII/2: Terms of Reference

- o Resource and environmental monitoring using radar, radar interferometry
- o Demonstration projects using ERS-1 and JERs-1 data
- o Studies of the applicability of radar data
- o Validation of new radar technologies

### WG VII/3: Renewable Resources

Chairperson: Frank Hegyi

### WG VII/3: Terms of Reference

- o Remote sensing applications to map and monitor renewable resources, including water, soil, agriculture, forests and other vegetation
- o Monitoring of land use

### WG VII/4: Geological and Mineral Resources

Chairperson: Dr. James Taranik

#### WG VII/4: Terms of Reference

o Remote sensing applications in geology, geomorphology, oil and mineral exploration

### WG VII/5: Terrestrial Ecosystem Monitoring

Chairperson: Dr. Paul Curran

# WG VII/5: Terms of Reference

o To understand how terrestrial ecosystems function at local, regional and global scales

### WG VII/6: Land Degradation & Desertification

Chairperson: M. G. Chandrasekhar

### WG VII/6: Terms of Reference

o Land degradation and desertification studies using remote sensing data

### WG VII/7: Hazardous Waste & Environmental Pollution

Chairperson: Dr. Vernon Singhroy

#### WG VII/7: Terms of Reference

o Monitoring of hazardous waste to environmental pollution using remotely sensed data

#### WG VII/8: Snow, Ice, Ocean & Coastal Zone Monitoring

Chairperson: Dr. Shintaro Goto

#### WG VII/8: Terms of Reference

o Remote Sensing technology and its applications to marine and cryosphere environment

#### WG VII/9: Human Settlement

Chairperson: Dr. Bruce Forster

### WG VII/9: Terms of Reference

- o Urban environment, planning and population monitoring
- o Historical geography
- o Archaeology

#### WG VII/10: Global Monitoring

Chairperson: Dr. Sergio Camacho-Lara

### WG VII/10: Terms of Reference

o International cooperation programs for global monitoring





This new Council will play the first violin during the period 1996 – 2000 Standing: Heinz Rüther, Klaas Beek, Mauricio Araya – Figueroa (representing Marcio Barbosa), Sitting: John Trinder, Lawrence W. Fritz, Shunji Murai

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