

Distr.
GENERAL

A/AC.105/545
1 April 1993

ORIGINAL: ENGLISH

COMMITTEE ON THE PEACEFUL USES
OF OUTER SPACE

REPORT AND PROCEEDINGS OF THE UNITED NATIONS/INTERNATIONAL
SOCIETY FOR PHOTOGRAMMETRY AND REMOTE SENSING WORKSHOP ON
REMOTE SENSING DATA ANALYSIS METHODS AND APPLICATIONS

(Washington, D.C., 6-7 August 1992)

CONTENTS

	<u>Paragraphs</u>	<u>Page</u>
INTRODUCTION	1 - 10	2
A. Background and objective	1 - 5	2
B. Organization and programme of the Workshop	6 - 10	2
PRESENTATIONS TO THE WORKSHOP	11	3

Annexes

I. Programme of the Workshop	1
II. Presentations to the Workshop	3

INTRODUCTION

A. Background and objective

1. The present report contains a summary of the proceedings of the United Nations/International Society for Photogrammetry and Remote Sensing (ISPRS) Workshop on Remote Sensing Data Analysis Methods and Applications. The Workshop was part of the United Nations Programme on Space Applications for 1992, as proposed by the Expert on Space Applications and recommended by the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space. The Programme was subsequently endorsed by the Committee and the General Assembly.

2. The Workshop was hosted and cosponsored by ISPRS and organized by the United Nations (Office for Outer Space Affairs) and ISPRS. It was held at Washington, D.C., from 6 to 7 August 1992.

3. The Workshop was held during the XVIIth Congress of ISPRS, held in Washington, D.C., from 2 to 14 August 1992; Workshop participants also participated in the ISPRS Congress. In addition, some Workshop participants also took part in the World Space Congress, the joint meetings of the Committee on Space Research (COSPAR) of the International Council of Scientific Unions (ICSU) and the International Astronautical Federation (IAF), held in Washington, D.C., from 28 August to 5 September 1992.

4. The objective of the Workshop was to provide a forum for scientists concerned with algorithms, software development, software systems and hardware employed in the reduction and analysis of data and their applications. Such a forum fostered communication between developers and users with a wide range of expertise in the production and use of software packages for photogrammetry and remote sensing applications.

5. The present report, which covers the background, objectives and organization of the Workshop and contains the texts of the papers presented to the Workshop, has been prepared for the Committee on the Peaceful Uses of Outer Space and its Scientific and Technical Subcommittee. Participants will report to the appropriate authorities in their respective countries.

B. Organization and programme of the Workshop

6. Represented at the Workshop were: Australia, Brazil, Canada, China, Finland, France, Germany, Japan, the Netherlands, Nigeria, Switzerland, Taiwan Province of China, the United Kingdom of Great Britain and Northern Ireland and the United Republic of Tanzania.

7. Funds allocated by the United Nations and ISPRS for the organization of the Workshop were used to cover the cost of international air travel, per diem expenses for participants and speakers for the period of the Workshop and the ISPRS Congress and registration for the Congress.

8. The Workshop was formally opened by a keynote lecture by D. K. Rasmussen from the Institute of Geography, University of Copenhagen, Copenhagen, Denmark. A welcoming address was also made by Dr. A. A. Abiodun, the United Nations Expert on Space Applications.

9. The United Nations developed the programme of the Workshop (see annex I to the present report) in collaboration with ISPRS. The Workshop was conducted through a series of three plenary sessions.

10. The participants expressed their appreciation to the United Nations and the International Society for Photogrammetry and Remote Sensing for organizing and hosting the Workshop, for their financial assistance and for the technical quality of the programme.

PRESENTATIONS TO THE WORKSHOP

11. Several papers were presented to the Workshop. The papers were grouped into three main themes, corresponding to the sessions of the Workshop: (I) Data formats, basic processing and image enhancement techniques; (II) Computer-assisted data interpretation and digital mapping; and (III) Integration of remote-sensing data and GIS. The text and/or charts of the papers presented to the Workshop appear in annex II to the present report. As most are technical in nature, they are reproduced solely in the language of submission.

Annexes

Annex I

PROGRAMME OF THE WORKSHOP

Thursday, 6 August, 0830-1645

Opening statement A.A. Abiodun, United Nations Expert on Space Applications

Key lecture: Remote sensing data analysis methods Geography, University of Copenhagen K. Rasmussen, Institute of

Session I: Data formats, basic processing
and image enhancement techniques

(Chairman: D.G. Goodenough, Canada)

Geometric and radiometric models
in processing SPOT imagery for
object-space surfaces

J. Wu, Center for Space and
Remote Sensing Research,
National Central University, Taiwan,
Republic of China

Image processing: edge and feature
extraction, linear feature extraction,
general segmentation, image matching
and object orientation

J.C. Trinder, School of
Surveying, University of New
South Wales, Sydney, Australia

Image analysis software

L.W. Hayes, University of Dundee,
Dundee, Scotland

Session II: Computer-assisted data
interpretation and digital mapping

(Chairman: B. Forster, Australia)

Intelligent information extraction
at the Canada Centre for Remote
Sensing

D. G. Goodenough, Pacific
Forestry Centre, Ottawa,
Ontario, Canada

Radiometric corrections for quantitative
analysis of multispectral, multitemporal
and multisystem satellite data

G. Guyot, INRA
Bioclimatologie, Montfavet,
France

Multivariate analysis techniques

N.J. Mulder, International Institute
for Aerospace Survey and Earth
Science (ITC), the Netherlands

Annex I (continued)

Image scanners and interactive

T. T. Sarjakoski, Finnish

workstations for semi-automatic mapping, with emphasis on low-cost solutions

Geodetic Institute, Helsinki
Finland

Friday, 7 August, 0830-1500

Session III: Integration of
remote sensing data and GIS

(Chairman: A. MacDonald, United Kingdom)

Extraction of quantitative information from remote sensing data and integration into GIS

E. Baltsavias, Institute of Geodesy and Photogrammetry, Swiss Federal Institute of Technology, Zurich, Switzerland

Integrations of sea surface temperature data sets using MOS-1 satellite data for validation and monitoring

S. Takeuchi, Remote Sensing Technology Center, Tokyo, Japan

Deforestation assessment using satellite imagery and GIS techniques

D. Alves, National Institute for Space Research, Sao Jose dos Campos, Brazil

Session IV: Discussion and Conclusions

(Chairman: A.A. Abiodun, United Nations)

Annex II

PRESENTATIONS TO THE WORKSHOP

CONTENTS

	<u>Page</u>
1. "Remote Sensing Data Analysis Methods", K. Rasmussen, University of Copenhagen, Denmark	5
2. "Geometric and Radiometric Models in Processing SPOT Imagery for Object-Space Surfaces," J. Wu, National Central University, Republic of China	21
3. "Image Processing: Edge and Feature Extraction, Linear Feature Extraction, General Segmentation, Image Matching and Object Orientation," J.C. Trinder, University of New South Wales, Australia	29
4. "Image Analysis Software," L.W. Hayes, University of Dundee, Scotland	77
5. "Intelligent Information Extraction at the Canada Centre for Remote Sensing," D.G. Goodenough, Pacific Forestry Centre, Ottawa, Canada	87
6. "Radiometric Corrections for Quantitative Analysis of Multispectral, Multitemporal and Multisystem Satellite Data," G. Guyot, INRA Bioclimatologie, Montfavet, France	129
7. "Multivariate Analysis Techniques," N.J. Mulder, ITC, the Netherlands	147
8. "Image Scanners and Interactive Workstations for Semi- Automatic Mapping, with Emphasis on Low-Cost Solutions," T. T. Sarjakoski, Finnish Geodetic Institute, Helsinki, Finland	157
9. "Extraction of Quantitative Information from Remote Sensing Data and Integration into GIS," E. Baltsavias, Swiss Federal Institute of Technology, Zurich, Switzerland	179
10. "Integrations of Sea Surface Temperature Data Sets Using MOS-1 Satellite Data for Validation and Monitoring," S. Takeuchi, Remote Sensing Technology Center, Tokyo, Japan	207
11. "Deforestation Assessment Using Satellite Imagery and GIS Techniques," D. Alves, National Institute for Space Research, Sao Jose de Campos, Brazil	217