

SOME ASPECTS ON PHOTOGRAMMETRIC AND REMOTE SENSING
EDUCATION AND RESEARCH IN GREECE, CYPRUS, YUGOSLAVIA AND ALBANIA

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VI

Abstract:

In the frame of the activities of the working group VI-1 of the commission VI of the I.S.P.R.S., this report presents the relevant work of the subworking group for the South Eastern Mediterranean Countries. Special attention is given on the task and activities of the recently established: a) National Organization for Mapping and Cadastre of Greece and b) Laboratory of Remote Sensing of the National Technical University of Athens, as well as on the efforts of Albania to promote Photogrammetry and Remote Sensing Education and Research in the University of Tirana. Finally, the development of Photogrammetry and Remote Sensing Education and Research of the University of Zagreb is presented.

1. Photogrammetric and Remote Sensing Education and Research in Greece

The University of Thessaloniki and National Technical University of Athens continue to carry out the main bulk of education and research in Photogrammetry, Photointerpretation and Remote Sensing in Greece. Their courses present no dramatic change from the past (Rokos, 1980 and 1984) but still a non-apparent improvement exists. With the reform of the relevant infrastructure courses (like mathematics and physics for example), after a continuous and interactive dialogue between the University staff responsible for them, Photogrammetry and Remote Sensing, the quality of education has certainly been significantly improved. If specific concrete activities within research projects, (in which, even first or second year undergraduates participate in the voluntary mode (University of Thessaloniki, Dept. of Cadastre, Photogrammetry and Cartography, and National Technical University of Athens, Dept. of Surveying)), are taken into consideration one could easily support that Photogrammetric and Remote Sensing Education and Research are going satisfactorily forward.

The law 1268/82 (Rokos, 1984) concerning the structure and function of Universities, obliged research assistants to work intensively with their Ph. D. theses, while new postgraduate students (Post-graduate Scholarship holders) are entering the University only under the above condition. In this way Greek University Departments have become active Research Centres as well. During the four last years (period 1984-1988) Photogrammetric and Remote Sensing Education and Research in Greece could be presented as follows:

1.1. National Technical University of Athens.

School of Rural and Surveying Engineering

Department of Surveying

Laboratory of Photogrammetry and Laboratory of Remote Sensing.

University Level, 5 years, M.Sc.(Dipl.R. and S.Eng.) Ph.D., (Dr.Eng.) average 120 students.

Courses: Photogrammetry 26 hours 26 hours Lab.
Stereophotogrammetry 26/26
Modern Photogrammetry 26/26
Photo interpretation and Remote Sensing 26/26
Special Topics of Remote Sensing 26/26

Staff: 2 Professors (Dr.J.Badecas and Dr.D.Kl.Rokos), 1 Lecturer (Dr.A.Georgopoulos), 12 Teaching and Research assistants, 1 technician

Specialization : Photogrammetric Surveys and Applications
Close Range Photogrammetry, Biostereometrics.
Analytical Photogrammetry.
Remote Sensing Applications in:Land Use and Natural Resources Inventories, Cadastral Land Information Systems and Integrated Surveys, Digital Image Processing.

Photogrammetric Instruments : Stereoplanigraph C8, Technocart, B8, Stereocord and HP9845S Computer SEG V Rectifier, different plotters, Wild C120 and P31 Cameras, 3P.C. Systems etc.

Remote Sensing Instruments: Interpretoscope, 40 mirror Stereoscopes, Sketchmasters, Zoom Stereoscope, 200 pocket Stereoscopes, 2 Digital Image Processing PC/A.T.Systems, Densitometer 10-K, 2 Hasselblad Cameras etc.

1.2. University of Thessaloniki

1.2.1. School of Rural and Surveying Engineering

Department of Cadastre Photogrammetry and Cartography

Laboratory of Photogrammetry

University Level, 5 years, M.Sc.(Dipl.R.and S.Eng.) Ph.D.(Dr.Eng.) Average 120 students.

Courses : Photogrammetry I 26 hours and 26 hours Lab.
Photogrammetry II 26/26
Photogrammetric Applications 26/26
Photointerpretation and Remote Sensing 26/26
Remote Sensing Applications 26/26

Staff : 1 Lecturer (Em.Kapokakis) (Prof.Dr. D.Kl.Rokos joined the staff of the National Technical University of Athens), 6 Teaching and Research Assistants, 3 Auxiliary Personnel.

Specialization : Architectural Photogrammetry
Close Range Photogrammetry
Digital Terrain Models
Photogrammetric Applications

Photogrammetric Instruments : Wild A7, A9, B9, E4
Restitution Instruments, Wild RAP-2 System,
Wild C 120, C40, P30, P32 Cameras
Hassellad and Zeiss Jena MRB Aerial Camera

Remote Sensing Instruments : RIPS Image Processing System,
40 Mirror Stereoscopes
100 Pocket Stereoscopes

1.2.2. Agricultural Department, Forestry and Natural Environment

Department and Geology Department of the University of Thessaloniki, offer also one introductory course on Photointerpretation and Remote Sensing.

26 hours and 13 hours Lab.(Ass.Prof. N.Syleos)
39/26 (Ass.Prof.M.Karteris) and
26/13 (Ass.Prof.T.Astaras) respectively

It is apparent from the above data that instrumentation has been improved (enriched and/or upgraded), in an effort to make contemporary technology available to both, the under- and the postgraduate level students. Financial restrictions, however, prevented the purchase of expensive pieces of equipment for each department (f.e. analytical plotters), a problem which is faced through the collaboration with the relevant public services and organizations.

A rather impressive increase of research interest in Remote Sensing is mentioned, following the advances and achievements on this discipline. University departments belonging to Schools like Geology and Agriculture show the above characteristic. With the aid of the Greek Ministry of Research and Technology, (now Ministry of Industry, Energy and Technology) practically all departments interested in Remote Sensing interact either to promote research through collaboration or to participate in international research projects.

The recently founded (1987) Laboratory of Remote Sensing of the National Technical University of Athens has as its main task to contribute towards this direction.

Photogrammetry, Photointerpretation and Remote Sensing in Technical Universities, have been directed, in a degree, along a National goal, that of the Greek Cadastre, which very recently was established by the Greek Parliament. A significant number of post-graduates work on technical or other Cadastral aspects while research teams of the above Universities, together with specialists from Production Organizations, participate in teamwork on National Research Projects concerning Cadastre.

A respectable number of photogrammetric instruments have been established in Higher Technological Institutions, which according to their programmes should provide to the country with a flexible technologist, who with a minimum of on the job training, would be able to face rapidly changing production requirements.

2. The Laboratory of Remote Sensing of the N.T.U. of Athens

The Laboratory of Remote Sensing of the National Technical University of Athens was founded in November of 1987 having as main task to serve research and education needs in the fields of Photointerpretation and Remote Sensing and their applications:

- in Observing and Monitoring of the earth,
- in Integrated Surveys of the Natural and Socioeconomic Environment and
- in the Formation of Integrated Cadastral Land Information Systems.

The specific aims of the Laboratory of Remote Sensing are :

1. The coverage of the education and research needs(both in undergraduate and graduate level) of the Departments of Rural and Surveying Engineers in general and special topics of Photointerpretation and Remote Sensing and their contribution to the foundation of Land Information Systems, as infrastructure for Development, Monitoring of the Environment and Land Policy.
2. Research and Development on methods and techniques of the relevant scientific fields.
3. The scientific and administrative coordination of the relevant research programs.
4. The cooperation of every type, on scientific, educational, research level etc. with Greek and foreign research centers, academic institutions, scientific/technical and social organizations as long as their scientific targets coincide, are similar or complementary with those of the Laboratory,

in a spirit of mutuality, integrated interdisciplinary approach and collective work.

5. The creation of theoretical scientific/technical as well as of technological infrastructure for the continuing improvement of relevant education and practical training methods and techniques.

6. The development of teaching and research programs for graduate students on Photointerpretation and Remote Sensing.

7. The organization or coorganization of Seminars, Symposiums, Conferences, Lectures, continuing engineering education courses for Dipl. Engineers and other scientists.

8. The rendering of services as it is provided in the article 7, par. 6 of the Law 1268/82 for the structure and function of the Universities.

9. The cooperation with relevant public agencies and social organizations (municipalities, communities etc.) and the support of their Development projects with the contribution of Photointerpretation and Remote Sensing.

10. The familiarization and specialization of Dipl. Engineers and other scientists in P. and R.S. topics and applications.

11. The creation of a special library and a file of aerial photographs and Computer Compatible Tapes of the Land and the Greek State from spatial or other platforms and their use for research purposes.

12. The development, independently, or in cooperation with other research, academic and scientific organizations of systems and methods :

a) for Natural and Human Resources Inventories of the country,

b) for Land Use Inventories and Mapping,

c) for the contribution of Remote Sensing to the creation of Integrated Cadastral Land Information Systems

d) for the elaboration of Integrated Surveys Programs

13. The connection and cooperation with the National Remote Sensing Centers and the agencies of acquisition of Space Remote Sensing Imagery.

3. The Organization for Mapping and Cadastre of Greece (O.M.C.G.)

The Organization for Mapping and Cadastre of Greece was founded by the Law 1647/86 after a long period of efforts for the legislation of Cadastre in our country (Rokos 1981).

The main aims of the above Organization are:

" The establishing keeping and update of a uniform and unique attesting Cadastre of Greece, geodetic coverage and mapping of the country, Natural Resources Inventories and Mapping and the creation of a Data Bank for Land and Environment "

The responsibilities of O.M.C.G. reflect with reliability, in institutional level its field of activities and its contribution to the objectively integrated nature of the process of development, as the best possible use and exploitation of the natural and human resources and potentialities of a country, each time within the frame of its natural and socioeconomic reality and dynamics and the relevant choices of its ruling class.

The first proposals for the necessary basic presuppositions and demands of the developmental process are published in our country at 13.4.1967 (Rokos 1981) using, as a background the critical study of the - up to then- contributions of Caroussos, Lambadarios, Xenos, Sokos, Barbaressos and Gazis and as a tool the scientific methodology of integrated approach and analysis of the specific conditions and needs of our country. Those proposals formed a basis for discussion, criticism, but also for further systematic work of both the author and of many colleagues in the Universities in the Technical Chamber of Greece and in the Greek Association of Dipl. Rural and Surveying Engineers.

The results of the relevant work were thoroughly discussed in scientific/technical commissions and were collectively promoted with the initiative of the Technical Chamber of Greece in the period of 1975-1978. The creative synthesis that was succeeded with the equal and essential participation of all the people, ultimately assured both the dynamics of an unanimity in scientific, social, political and syndicalistic level, which for the first time overcame long-lasting and stationary, secondary and of corporative nature oppositions, but also the predominant by then "partial" and metaphysical concepts for the development that most of the people visualized one dimensionally, either as :

- a process of increase of some fictitious, per capita indices and economic quantities, that could be succeeded using the economical planning as the only tool,
- a process of intensive exploitation of the (known) natural resources,
- or as a process of programming and carrying out of big (usually without any feasibility study) technical works.

The collective work of the Technical Chamber of Greece during the period 1975-1978 for the legislation of the Integrated Cadastre of Greece influenced but also was influenced, dialectically, by correspondent efforts of colleagues from abroad that approach from different points of view, but with the objectiveness and the dynamics of the scientific methodology, in an equivalent way, the need of substitution of the traditional forms of Cadastre in all the systems, that faced special problems, with forms of the Integrated Cadastre.

The O.M.C.G. has already organized study groups for the creation of the necessary infrastructure upon which its main work will be based (Choice of the Geodetic Reference System and Technical Specifications for the establishing and keeping of the National Cadastre, Remote Sensing contribution for the acquisition of the qualitative information about Land and the Environment, etc.) and is now programming its decentralized, structure and function.

4. Photogrammetric and Remote Sensing Education and Research in Albania

The University of Tirana, School of Civil Engineering, Chair of Geodesy is the institution responsible for Education and Research of Photogrammetry, Photointerpretation and Remote Sensing in Albania. The School produces a flexible type of engineer to cover a wide range of applications in the country. Photogrammetric courses offer a good theoretical background which is clearly not supported by appropriate contemporary instrumentation. The collaboration with production organizations is of vital significance.

The University of Tirana has documented the need to promote photogrammetric education and research. In 1984 it invited through UNESCO Prof. Dr. D. Rokos, to contribute as a consultant in an attempt to upgrade the Photogrammetric and Remote Sensing courses and laboratory. Due the other obligations of Prof. D. Rokos a commonly planned and designed program of activities, with Dr. E. Kapokakis, Lecturer of the University of Thessaloniki, has been presented by the second in the University of Tirana. Research, up to now, has been oriented mainly on aspects of terrestrial photogrammetry, biostereometrics and other areas which can be supported by the existing instrumentation. Aerial photogrammetry is practiced in Albania, by military services, for which no information is available. It is believed that in the near future the laboratories will obtain more efficient instruments to allow for research on other areas of the science as well.

Photogrammetry and Photointerpretation are being taught to the undergraduates of the above institution in four (4) semesters, five (5) hours per week courses.

Remote Sensing courses are not included in the official study programme and relevant information is given to the students only on the basis of the personal interests of the staff. There is no evidence of satellite imagery availability in the country.

Photointerpretation is covered within a few lecture hours and is restricted to the very basic methods to extracting qualitative information from aerial photographs. Photointerpretation does not seem to exceed 5% of the mentioned Photogrammetric training period.

Photogrammetry is the main subject of the four semesters. Terrestrial and aerial photogrammetry aspects are given with adequate although rather outdated detail. Laboratory facilities include a few mirror stereoscopes, a small stereocomparator and a multiplex-type stereoplotter and training is mainly oriented to theoretical aspects and lots of in-the-classroom exercises. A few students undertake M.Sc. dissertations on applications of photogrammetry, mainly terrestrial, due to the availability of relevant instrumentation from public enterprises.

Research is performed by research assistants, the lecturing staff and a few engineers in public enterprises. The main research areas seem to be terrestrial photogrammetry applications for topographic mapping, monuments surveys and biostereometrics. Some specific data for Albania are listed below:

4.1. University of Tirana

Faculty of Civil Engineering

Chair of Geodesy

University Level, 5 years, Dipl. Eng. average 40 students

Courses : Photogrammetry I 130 hours
Photogrammetry II 60 hours
Photogrammetry III 60 hours

Staff : 1 Professor (J. Guxo, teacher)
2 teaching Assistants, 3 Researchers
1 Technical Personnel

Specialization : Terrestrial Photogrammetry, Biostereometrics

Photogrammetric Instruments : 1 Multiplex, 1 Jena Stereocomparator

Photointerpretation Instruments : Interpretoscope, Mirror Stereoscopes

Research and Development : Total number of employees 4 (3 with University degrees, 1 technician) in the field of Photogrammetry.

It should be stated here, that the information given above is correct for the period June 1985 - end of 1986, and that beyond all the difficulties, Albania, which is one of the more independent nations in the world, will find its own way to promote Photogrammetric and Remote Sensing Education and Research, taking into consideration their invaluable contribution towards an Integrated and self sustaining Development of its natural and human resources.

5. Photogrammetric and Remote Sensing Education and Research in Yugoslavia
With the kind contribution of Prof. Dr. Ing. F. Braum we could only update the relevant (Rokos 1984) information for Photogrammetric and Remote Sensing Education and Research of the Institute of Photogrammetry of the University of Zagreb.

5.1. University of Zagreb

School of Geodesy

Institute of Photogrammetry

University level, (1) 4 years, Dipl. Ing. (Hochschule) 40 students

(2) 2 years, Ing., average 14 students

(3) 2 years, Magister

Technician level (4) 2 years, Photogrammetric technicians,
average 80 students

Courses : (1) Photography 36 hours (1 semester)
(1) Photogrammetry I 84 hours (2 semesters)
(1) Photogrammetry II 96 hours (2 semesters)
(2) Photogrammetry I 36 hours (1 semester)
(2) Photogrammetry II 72 hours (1 semester)
and diploma thesis
(3) Photography, Photogrammetric Survey, Photogrammetric field works,
Automation in Photogrammetry, Program, Orientation and Model
Deformation, e.t.c. Photointerpretation, Applications in Ar-
chitecture e.t.c., 410 hours and magister thesis
(4) Photogrammetry 68 hours
Photogrammetry 64 hours

Staff : 5 Professors (Dr. Eng. T. Fiedler, Dr. Ing. F. Braum, Dr. Ing. V. Donassy,
Dr. Ing. M. Brukner, Dipl. Ing. K. Šmit)
1 Researcher Dipl. Ing. J. Pleško, 4 technicians

Specialization : Photogrammetry applied in Cadastre, Aerotriangulation, Ar-
chitecture, Civil Engineering, Sculpture, Medicine.

Photogrammetric Instruments : Autographs A7, A8, A5, A6 Aviograph B8, Aviotab,
EK22, Rectifier, Stereocomparator, Stereomicrometers, Pho-
teo 19/1318, UMK 10/1318, Camera Linhof Technica, Hassel-
blad MK70, Koppiergerät KG30, Luz Jena, Complete Photogra-
phic Laboratory and Computers (Hewlett-Packard 9845-S etc.)

Remote Sensing Instruments : 4 LUZ

6. Some final remarks and Acknowledgments

The Department of Geography of the School of Geology of Athens University is also developing during this period, Remote Sensing activities in Greece, both in Education and Research (Prof. Dr. M. Moutsoulas).

The Organization for Cadastre and Mapping of Greece is going to undertake an initiative for cooperation with all the academic Remote Sensing Laboratories in the near future.

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7. References

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