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ADVANCES OF PHOTOGRAMMETRY, REMOTE SENSING AND GIS IN LITHUANIA DURING TEN YEARS INDEPENDENCE

Abstract

There will be outlined activities, developments and involvement of various organizations including governmental institutions, non-governmental organizations, private companies, consultation services, universities and users. Collection of information has been made on the basis of questionnaires to organizations involved in photogrammetry, remote sensing and GIS, by summarizing obtained material from numerous professional meetings, seminars, conferences, published papers and personal knowledge of activities. In Lithuania during 10 years Independence period the significant changes of techniques with render help foreign western supporters there has been made considerable advances in applying of automated digital systems that give new possibilities for modern mapping in many fields of science and practice.

1. Production institutions

The Lithuanian Society for Photogrammetry and Remote Sensing is the adhering body to the International Society for Photogrammetry and Remote Sensing and is a not-profit organisation as well as is not funded by any institution, existing solely for the purpose of advancement the profession knowledge in the field of Photogrammetry and Remote Sensing, including GIS. The National Society was founded in 1992 and has currently about 20 members. This rather small membership is characteristic of a small country, which for many years was incorporated to Soviet Union and photogrammetric practise was determined by the Russian Survey. The number of private companies and other institutions active in photogrammetry has not increased considerably during the last years (currently 8). Photogrammetry and Remote Sensing applications are rather limited in Lithuania, because of finance stage in a small country. After restoring the Independence in 1990, Lithuania has gained support from several countries of the Europe (Switzerland, Norway, Sweden, Denmark, France, etc.) for development photogrammetry.

The main photogrammetric - cartographic institution is private joint - stock company Institute of Aerophotogeodesy in the town Kaunas. There the stereophotogrammetric mapping is being carried out by Leica analytical photogrammetric instruments SD 2000, when calculations of aerial triangulation networks are being provided under use software PATB-RS GPS. Two Digital Photogrammetric Workstation Intergraph SOCET SET (Helava-Leica Gde Systems) are implemented for production of digital orthophoto maps, for renewal

topographical maps, etc. To-day, the produced digital orthophoto maps at a scales of 1: 10 000 and 1:50 000 already cover approximately 80% of Lithuania's territory.

National Centre of Remote Sensing and Geoinformatics (State Enterprise GIS-Center) was established in 1992. Its fields of activity are: digital cartography, GIS databases, GIS software, consulting and training. There using software Arc/Info, Arc/Info NT, ArcView, GeoVektra, EasyTrace, Erdas Imagine has been created such products:

- georeference database GDB200;
- digital database of Lithuania satellite map at scale 1:50000 (LTDBK50000-V);
- digital ortophotos ORT10LT;
- digital relief information (at different scales);
- digital elevation models (DEM's);
- large scale databases.

The joint private company Lithuania-Iceland HMIT-BALTIC GeoInfoService (HB-GIS) was founded at the end of 1993. Sphere of company activity comprises introduction of GIS systems, consultation, production activity for exploitation of communication networks, application GIS in cadastre and real estate registration, GPS usage in geodesy and photogrammetry. There are working 28 specialists of high qualification in the digital cartography and GIS fields. Also HB-GIS is distributor in Lithuania of software ARC/INFO, SDETM, ARCVIEW, GeoVektra and representative of ESRI Inc. (Redlands, USA), software developers for satellite images analysis and treatment TRIMBLE Navigation (Sunnyvale, USA) and ERDAS (Atlanta, USA), HMIT hf. (Iceland). Hardware comprises local computer network, working stations SUN, Hewlett-Packard UNIX and PC Pentium II/III; geodetic instruments Pathfinder Pro XRS GPS, Wild T1000.

The private company CAD&F Project Service mostly is working for preservation of architectural heritage. There on the basis of terrestrial photography are being established 3D digital models for various architectural monuments by the use CAD-Sprit system, etc. The photogrammetric station SD -2000 and computerised Wild autograph A8 have been implemented for compiling photogrammetric, GIS projects in Lithuania and other countries. On the basis of aerial photography at a scale of 1:3 500 there was constructed the digital map of city Vilnius for old town region

In Geodesy Institute of Vilnius Gediminas Technical University is established the digital photogrammetry laboratory. There on the basis of aerial photographs at a scale of 1:6 000 has been constructed the basic digital reference map at a scale of 1:1000 for city Vilnius. The laboratory is equipped with two computerised Wild autograph A8, etc. Aerial triangulation is being carried out by computerised Stecometer under use of Norwegian software NLHBUNT. The computerised photogrammetric instruments stereosimplex IIc and stereocomparators Steco 1818 are chiefly devoted for education and training purposes.

The private company ALNA is the leading information technology company in Lithuania and provides the software design services, computer hardware maintenance, GIS training. ALNA is oriented to design, to integrate the complex of information systems as well as is representative of Z/I Imaging corporation (combined the Intergraph Photogrammetry and Remote Sensing subdivision with Carl Zeiss Photogrammetry and Aerial Reconnaissance subdivision).

2. Educational activity

The extensive changes have been done in educational structures during ten years of Lithuania independence. Three universities (Vilnius Gediminas Technical University, Agriculture University, State Vilnius University) provide full or partial education in photogrammetry. Training in photogrammetry is the concern mainly in the Faculty of Environment Engineering at the Vilnius Gediminas Technical University. There approximately 50 students of Geodesy and Real Estate Cadastre specialities take up respective studies for Dip. Eng. and MSc. degrees the each year. During the last time four doctoral theses in photogrammetry and GIS have been accepted and successfully confirmed. They are: “Methods for establishment and processing of geodetic and photogrammetric networks”; “Investigation of photogrammetric mapping in large scale”; Investigation of optimal city geoinformation system”; “Methodology of building information system for thematic cartography”. Photogrammetry is also taught in other three technical schools of the country.

The surveying education in Lithuania should be improved through the implementing new technologies, particularly in Digital Photogrammetry and Remote Sensing, by acquiring Photogrammetric Digital Workstation, literature and participating in qualification courses organised in various developed countries.

Vilnius Gediminas Technical University has been organised annual republican as well as in every two years International conferences “Civil Engineering and Geodesy” where it is considering Photogrammetry, Remote Sensing, GIS application techniques, theoretical approaches and issues publishing on proceedings. Journals “Geodesy and Cartography” and “Land Planning and Reclamation” are scientific issues that include articles of developing photogrammetry science and GIS in Lithuania.