

# NATIONAL REPORT OF THE CZECH REPUBLIC AND SLOVAK REPUBLIC

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### **ABSTRACT:**

The national report is compiled from several contributions. The report try to show the development in the field of photogrammetry and remote sensing in both republics.

## 1. INSTITUTIONS

The Czechoslovakia has been a member of ISPRS since the year 1930. After political changes at 1989 arose at the year 1993 two independent republic, Czech and Slovak. The Society for Photogrammetry and Remote Sensing in former Czechoslovakia did not divided from several reasons. From February 1996 each republic has own society.

## 2. EDUCATION

Czech Technical University in Prague, Technical University in Brno and Slovak Technical University in Bratislava offer courses of photogrammetry and remote sensing with substantial content in line of study geodesy. Several other universities include especially remote sensing in general courses. Universities often have not sufficient funds to buy new instruments and modern technologies.

## 3. PHOTOGRAMMETRY

The branch of state administration of surveying, mapping and cadastre in Czech republic has applied photogrammetric methods in very restricted way. This dumping was caused by following reasons. Due to restitution of real estates and especially of agricultural and forest lands to their original owners after 1990 there were many changes and subdivisions of land parcels. Therefore, new cadastral mapping in large areas was stopped completely. This should last until the complex land rememremment will be finished. A new revival of progressive methods of analytic and digital photogrammetry is expected round the year 2000. The only remaining photogrammetric job in the branch of state administration is updating of basic topographic maps at the scale 1:10 000 existing still in the old usual graphic form. This is done by the graphic evaluation on analogue universal instruments in map print base. In 1995 the data acquisition of the fundamental topologic-vectorial base of geographic data (ZABAGED) started, details of this base corresponded to the map at the scale 1:10 000. There are 4550 map sheets on the nation

territory and this data acquisition should be completed at the end of the year 2000.

Due to considerable increase of private companies in photogrammetric activities all progress took place mostly in private sector. Private companies buy photogrammetric aircrafts (now are two Cessna TU-206F in operation), modern technologies ( 6 images stations from Intrgraph). Some of important companies are Geodis Brno Ltd., Argus Geo System Ltd., Help Service Group. The last mentioned companies is pointed on GIS and at the present this company is developing system for digital photogrammetry PhoTopol.

## 4. REMOTE SENSING

In the Slovak republic science was concentrate in the area of remote sensing upon the solution of grant project Analysis of the Landscape Changes by Application of the Remote Sensing Data. The aim of the project is identification, assessment and map presentation of the changes of the landscape objects demonstrated on cases of parts of the Liptov and Bratislava with its hinterland, by application of multitemporal remote sensing. The Institute of Geography participated on the solution of the following European Commission Projects:

CORINE Land Cover Project . Interpretation of satellite image maps of the territory of Slovakia(53 sheets) was finished. Results of interpretation - interpretative schemes are at the present digitised by the GISAT company in Prague.

MARS and Environmental Related Applications - MERA Project . National Focal Point for the MERA project in Slovakia is the Soil Fertility Research Institute in Bratislava. Reached results presented in a form of report provide basic characteristics of the contemporary research of soil erosion in Slovakia, proposals of methodologies for the mapping of soil degradation by application of remote sensing data and survey of the published works in the field of soil degradation in Slovakia.

The Geocomplex Ltd. used satellite data in frame of following environmental projects:

TIBREG - assessment of the natural resources in relation to the environment in the part of Slovakia and in contact parts of Ukraine and Hungary . The Landsat TM images have been used. The colour composition have been

compiled for geological interpretation purposes. The map of brightness, greenness, wetness, biophysical indications and surface temperature for ecological assessment have been compiled too.

KOSICE - biotic and abiotic components of the environment. The same maps as mentioned above have been prepared in Kosice district region, using SPOT pan and Landsat TM satellite images.

The Remote Sensing Department at the Slovak Environmental Agency is responsible of the remote sensing and GIS implementation in the relevant informatic and monitoring projects of the Slovak Ministry of Environment. During the period 1994 -1995 ensured pre-processing, georeferencing and distribution of the SPOT panchromatic images along with the basic vector coverage ready-to use in PC Arc View environment at all 39 districts info-workplaces over the all Slovakia as an initial stage of RS and GIS implementation in the partial monitoring systems Settlement, Land Use and Waste of the future Slovak Environmental Information System. Data from the LANDSAT TM along with the DEM were implemented into the processing of the Territorial Development Strategy and GIS analysis/ compositions of the Slovak republic at the scale 1:500 000. Remote Sensing Department of the Slovak Environmental Agency continues in these activities towards scales 1:25 000 up to 1:50 000 with gracious help of the Canadian CCRS, Geomatics Int., PCI and on the contract base with SSC Satellitbild and ArcGeo ESRI local distributor.

Activities of the Forest Research Institute in Zvolen, in the field of remote sensing, are aimed at improvement of collection methods and assessment of forest damage. Satellites Landsat TM and SPOT images, aerial photographs of various scale, videodata in visible and infrared range and spectroradiometry are sources of information. The aerial photographs in the aerochrome infrared Kodak 2443 are provided by their own aeroplane which is adapted for photoverision. The aeroplane is being used also for aerial monitoring on the signalised permanent monitoring plots established in forests in the hole territory of Slovakia in network of 16x 16 km. In addition to these activities we cooperate in the solution of the European n Commission Project MERA, in a part of this Project denoted as Forest Ecosystems.

Laboratory of AI, Technical University in Kosice is responsible of the Slovak - US Program for Science and Technology of Geography, Kent State University, Kent, Ohio, addresses the issue of land cover classification accuracy in the context of data derived from fuzzy classifiers. The project tends to determine the degree to which spatial variations in spectral response affect the relationship between fuzzy classifier output and subpixel class area proportions. Information on sub-pixel class composition is to be derived by merging remotely sensed TM data with data collected from maps and from ground-based surveys. The second goal is to study fuzzy pattern recognition techniques which can be useful in remote sensing technology.

In the Czech republic national activities in remote sensing have been focused on varios kinds of applications. Two nation-wide projects have been undergoing in the country. One is the mapping CORINE Land Cover projects accomplished under frame of the Phare programme (GISAT company). It includes

production of the digital database of land cover units over entire country at the scale 1:100 000. The data have been obtained by visual interpretation of Landsat TM geocoded images followed by digitalization. The database will be consistent with similar products in the other European countries. The second large project gives fast information about crop areas to the Ministry of Agriculture. Based on classification of the Landsat or Spot satellite imagery the information provided contain update agreges of the main crops on regional or district levels. Due to cloud coverage it is not possible to get information over hole country during one vegetation season. Traditionally, the satellite data play important role for monitoring conditions of the forest. Landsat TM scenes are processed to get maps presenting the distribution of different stage of damaged forests. The first complete map of the forest health stage has been prepared by Ministry of Agriculture in 1995. New activities arre connected with usage of radar data. ERS-1 and ERS-2 data have been used for the production of space map at the scale 1:200 000. The image maps provide a base for geological and geomorphological analysis of the area along the new oil pipeline construction.

The Remote Sensing Centre at Land Survey Office in Prague is engaged in airborne thermal infrared sensing. The apparatus AGEMA THERMOVISION 880LWB being at disposal is used to produce thermal maps. The thermal scanning covers a wide range of applications for example: At the 1994 the leakage from dam Horka, thermal scanning of surface of the hazardous toxic waste deposit of Spolchemie company in Chabarovice, heat loos from roof of building in area Škoda - VVV company.

The Czech Academy of Science reduced number of institutes and specialists. Reduced Institutes are pointed on regional projects.