Opening Address

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Working Group for Information Systems and Services
of the Committee on Earth Observation Satellites

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Ladies and Gentlemen,

It is a great pleasure for me to welcome you in Budapest for the first time when this famous organisation, Working Group for Information Systems and Services of the Committee on Earth Observation Satellites has organised its meeting in our place, honouring the Hungarian professional community in this way.

As I understood, the Committee on Earth Observation Satellites (CEOS) is an international mechanism with the mission of coordinating the international space research programmes and within that the civil space borne missions. These programmes concentrate mostly on studying and observing our Earth. CEOS is well known as a major international forum; its main intention is to bring together the participants of programmes of this kind all over the world, strengthen the relations among users of space borne data and coordinate the use of those data for a better efficiency.

Maybe you know already, dear participants that Hungary has been participating for many years in the processing, use and research of data originating from Earth observation satellites. A Decree of the Council of Ministers issued in 1979 (Nr. 3514/1979) contains provisions as to start remote sensing research work in Hungary. In line with this Decree, the National Meteorological Service is responsible for the procurement, use and research of satellite images with resolution less than 80m, while the same duty concerning images of higher resolution than that became the duty of the Institute of Surveying and Mapping (FÖMI). The Ministerial Decree Nr. MÉM 5/1980 regulates the activity of the latter Institute. Accordingly, a Department of Remote Sensing was organised in FÖMI, the duties of which are divided into three correlating, but well separable areas:

- Procuring and archiving satellite images and airborne photographs for remote sensing purposes;
- Pre-processing and servicing satellite images and aerial photographs for users nationwide, supplying information on the current achievements, servicing Earth observation satellite data (issuing circulars), providing education on various levels, including self-education) and expertise for the users' projects;
- Elaboration of processing methods, technologies supporting data use, mostly for the purposes of
  - the agriculture,
  - the environmental protection and water management,
  - the regional development, and
  - the mapping.

FÖMI Remote Sensing Centre (RSC) solved those tasks in cooperation with the Ministry of Agriculture, the National Board of Technological Development, the Intercosmos Council of the Academy of Science, universities and other research institutions.

There is a special group, which is responsible for the elaboration of the procurement, pre-processing, servicing, research, methodology, instruments and development results, which are necessary for solving remote sensing tasks. Between 1980 and 1986, with significant efforts and investments – about 100 man/year – this group formed an instrumental and methodological basis for various aimed R+D (Research and Development) themes. We developed the system of procurement and technological conditions of accepting, pre-processing and archiving various digital and analogue satellite data and their distribution for users nationwide. To do this job, almost parallel with the launching of satellites, we made commercial contracts with GOSCENTR PRIRODA, EURIMAGE, SPOTIMAGE and ESA, and later with the clearing houses for new satellite data (EUROMAP, IRS of India, RADARSAT, Canadian radar images; with Soyuzkarta for 2m resolution KOSMOS images, SPACEIMAGING for 1m resolution IKONOS images) to be the Hungarian dealer/distributor of those images.

In 1982, FÖMI Remote Sensing Centre joined and became the active participant of the European Space Agency's EARTHNET programme. In 1986, the Annual NPOC Meeting with a Workshop devoted to the agricultural application was hosted by Hungary. Parallel with signing the contracts, we provided the users with the access to new type data, studying data and also made possible their processing in Hungary. Till 1998, the users had regularly and continuously been informed through circulars about the achievements and the data of current remote sensing satellite data. We managed to set up unique archives of satellite data of various types and resolution, covering many times the area of Hungary. Beyond satisfying the demands of Hungarian R+D and operative activities, this excellent collection also serves as a basis for monitoring the changes of the last decades, in case of need completing them with the data from the original data sources.

One of the major, determinant and internationally acknowledged programmes of the Remote Sensing Centre is the one for national monitoring crops and their yield forecast. The aim of this programme, which started in 1982, was to create an operative procedure, as the precise and reliable information is vital for supporting stability of the markets for both national and international crop production and food supply. Continuous monitoring of national crop production, displaying drought areas or crop diseases, identifying the size of damages caused by log water or flood, objective survey of its quantity and the location of crop failure and yield forecast, plus the elaboration of remote sensing solution for all these became significant on the level of national economy. This is especially important in the agricultural transformation of the recent years. By the 1980s, certain results of FÖMI RSC in crop area assessment and crop yield forecast reached – in some cases also exceeded – the European level.

FÖMI RSC made foreshadowing progress in research work performed in the field of using remote sensing methods in environmental protection. Being the only participant from Eastern and Central Europe of the PEPS – an international research programme preceding the launch of SPOT1 – we had the opportunity of studying demonstration data of new type when analysing the environment of Kisköre water reservoir (Upper Tisza river, Hungary).

The Hungarian Space Research Office set up in 1992 helped a lot in our remote sensing activity. Out of the whole Hungarian space research programme distributed among various professional fields, this office dedicated 40% to the science of Earth observation and remote sensing. We must not forget about the precious help given to us by the European Space Agency too, long before Hungary joined the EU.

It can be considered as a significant result that on the initiative of FÖMI RSC, the EU within its Phare Aid Programme has allocated funds for the introduction of the European CORINE Land Cover at scale 1:100 000 CORINE Land Cover in five countries (Bulgaria, the Czech Republic, Hungary, Poland and Rumania). It is a special recognition to us that out of those five countries, Hungary was only authorised to perform digital processing and photographic display of the satellite data. This programme was successfully completed: within less than three years, CORINE Land Cover database covering the whole area of Hungary got ready. The institutions of the Ministry of Environmental Protection, the local governments and other organisations are making good use of this database. In line with the Governmental Decree 2339/1996. (XII.6.), we improved the programme, elaborating the CORINE 1:50 000 version containing data, which are much more useful for Hungary. Between 1998 and 2002, we developed a CORINE Land Cover database of high resolution and covering whole Hungary – this is unique within the EU. From 2002 to 2005, we played an active part in coordinating the revision of EU CORINE Land Cover Database (CLC2000 Project), supporting the activity of the European Topic Centre-Terrestrial Environment (ETC-TE).

Between 1996 and 2003, FÖMI RSC carried out operatively crop yield forecast for eight major crops nationwide, according to the schedule determined by the Ministry of Agriculture and Rural Development: this shows the success of the Agricultural Remote Sensing Programme. The concordance of the forecast data and the facts proves the procedure correct, so we trust that from the coming year on we can restart the crop yield forecast programme based on satellite data.

The efficiency of this programme is also proven by the fact that using its knowledge and instrumental basis, we performed operative surveys of damages caused by log water, flood and droughts several occasions in the past years. Our significant success is the vineyards/orchards area-surveying programme using satellite images, the data of which were collected for the Central Statistical Office in 2001. This programme forms the basis of the vineyard register called VINGIS – prescribed now by an Act – based on GIS; this will be ready nationwide by the end 2006.

The EU area-based agricultural subsidy and its operative control being performed in Hungary have also been supported by remote sensing methods since 2004.

The high-resolution satellite images and their introduction into practice gave a new impetus to the cartographic adoption of remote sensing procedures too. We have been using SPOT-4 satellite images – transformed into Uniform National Projection System based on Digital Elevation Model of cell size 100m x 100m and covering the whole country – for scheduling the revision of the topographic maps at scale 1:10 000 and defining the volume of the job. The topographic maps at scales 1:50 000 and 1:100 000 can be revised quicker and be more cost-efficient in this way. With the satellite images of resolution 1m and 4m, our data acquisition resources are extended. Since 2003, a digital elevation model of 5mx5m cell size and $\pm$ 70cm Z accuracy plus the orthophoto dataset of 50cm resolution completed in 2000 and 2005 within the Hungarian Digital Orthophoto Campaign, both covering the whole area of Hungary have been available for the digital and geometrical transformation of those high resolution satellite images (and aerial photographs).

During the past ten years we have successfully been participating in carrying out of several international R+D tasks. Having performed EU, EU PHARE, EU MARS, MERA and ESA programmes (e.g. PRODEX), now we are having a firm place among the EU institutions and we also can make good use of our own results at the same time.

To give you a full overview on our international relations and activities: this would be more than was expected of an opening speech. But two important events are still worth mentioning. In 1990, as first one of the Eastern and Central European institutions, FÖMI RSC became full member of the European Association of the Remote Sensing Laboratories (EARSeL), having more than 300 scientific member-institutions. In 1992, – also as first one from this European region – we were honoured to host the 12th EARSeL Symposium in Eger, Hungary.

In the period 1996-2002, VII. Committee (Remote Sensing) of ISPRS (International Society of Photogrammetry and Remote Sensing) – which is a CEOS member, too – was directed by Hungary through its chairman, *Dr. Gábor Remetey-Fülöpp*. Accordingly, Hungary was authorized to host the worldwide conference of remote sensing professionals in the headquarters of the Hungarian Academy of Science in 1998. Connected to this event, satellite SPOT-4 launched in March 1998 took its first image of Hungary, namely the southern Baja region, which went around the world press specialised in remote sensing.

I have to tell you some words about the activity of the Satellite Geodetic Observatory of FÖMI under the direction of our Ministry. They celebrate the 30th anniversary of the foundation in this year.

This observatory, which was founded with the expressed aim of observing satellites, at the end of the 80s, – at the dawn of the dissemination of GPS technology – has introduced the application of this up-to-date positioning system of high accuracy in Hungary.In the 90s, they created the National GPS Control Network, which – by determining more than 1000 points with GPS out of high order (closing with fourth order) points of terrestrial triangulation network – allowed introducing GPS measurements of geodetic accuracy in Hungary. Currently, the development of a nationwide active permanent GPS network is underway; we expect it to be ready by the end of 2006. The service of the permanent stations already operating is available for anybody through Internet. National GNSS Service Centre is organized as well. We are participating in the introduction of EUPOS in Hungary; the building up of its pilot network around Budapest has already started.

Ladies and Gentlemen!
So far as I know, the main aim of your Working Group (WGISS) is to stimulate, coordinate and monitor the improvement of the information systems and services within CEOS programme. I hope this brief account on the related Hungarian achievements has convinced you that it was worth organizing your present meeting here with us, which allows you to show your own results to the Hungarian experts. At the same time, you can find those contact points, through which you can mutually help each other and increase the efficiency of your activities.

I wish you a successful meeting and a pleasant week in Budapest!