

EXPERIENCE OF RUSSIAN GEOPORTALS BASED ON EARTH REMOTE SENSING DATA

V. Gershenzon, E. Ash

SCANEX Research & Development Center, Moscow

Commission WG IV/5

KEY WORDS: Geoportals, Space Images, Geoinformation Services, Remote Sensing

ABSTRACT:

Quick development of information technologies lately had an impact on traditional methods to search, to process and to display geographic information. Obviously this happens due to the geoinformatics being transformed from a science for specialists into a science for the public. Presented information relevancy, adequacy and accessibility became of superior value. Therefore geoinformation on-line services start to play an increasingly more important part in meeting the cartographic requirements of a wide range of users.

However, one has to understand the difference between the on-line map services and geoportals, based on the remote sensing data, stitched into a single seamless color-balanced mosaic. The advantages of the latter are quite obvious: a map is a conventional signed model of the Earth surface, in most cases requiring special skills to be able to read it. Satellite images give a more user-friendly and updated presentation of geo spatial information. It should be always kept in mind though that the space imagery data open unlimited possibilities to the specialists for thematic interpretation.

Operationally updated seamless mosaic image coverages became the foundation of a geoportal as the most effective solution to resolve the problem of geoinformatics introduction into governmental structures, public life and commercial companies.

Popular foreign open commercial geoportals, such as Google Earth/Google Maps, MS Virtual Earth, Yahoo! Maps using remote sensing data are well-known worldwide. Today, we can mark out two Russian Internet-project, offering geospatial data services: maps.yandex.ru (Yandex Maps) and kosmosnimki.ru, with satellite images being prepared by the specialists of SCANEX R&D Center.

Satellite-based data represent geospatial information in great demand by the public. They also serve as a unique basis to distribute different spatial information and to generate various customer services.

Geoportals ideology development implies the creation of a network of geoportals, connected by single principles, technology and architecture and aimed at meeting requirements of different target groups: special government-oriented (Business-to-Government, B2G), industry-oriented (commercial – Business-to-Business, B2B), public-oriented (Business-to-Customer, B2C) geoportals.

Special B2G geoportals are created to render geoinformation services to governmental authorities, using secure communication links and restricted access protocols. The main advantage of B2G geoportals is the optimization of management and substantiated decision-making based on actual geospatial data backup by additional reliable data sources.

Industry-oriented commercial B2B geoportals are being created based on the orders received from major widespread national corporations and companies, as a means of corporate governance, visualization and giving a “big picture” of geospatial situation. Functionally B2B geoportals are also aimed at increasing the efficiency of management due to a comprehensive and near real-time presentation of different information together with geospatial description of objects and processes.

Open public B2C geoportals aim at rendering on-line services to a wide range of users (same as Goggle Earth). B2C geoportals are designed to satisfy the customer’s demand on information and directory services with data georeference. Yandex Maps project can be easily named as the Russian example of a B2C geoportal. It is very popular among the local users and its principal difference from the international prototypes is in “fresh” image coverage and in a higher spatial resolution of the displayed satellite images.

Kosmosnimki geoportal is a “test site”, where SCANEX Center specialists develop own remote sensing data display technology as the basis of geoportals and design multiple add-on modules capable of meeting all possible demands of the customer.

To date, SCANEX R&D Center, having a network of its own ground receiving stations, can provide for a complete coverage of the Russian and CIS territory with updated satellite images at 5.8-10 m resolution (2006-2007) with individual highly detailed populated and industrial areas at 0.7-2.5 m. At the same time the baseline coverage at middle resolution, with VHR data available for the areas of interest, can be fully updated within 2-3 years.

Geoportal, based on highly detailed and regularly updated mosaics of space images, is a universal launch pad for the development of different interdepartmental, industrial, scientific, educational and public services.

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However, one has to understand the difference between the on-line map services and geoportals, based on the remote sensing data, stitched into a single seamless color-balanced mosaic. The advantages of the latter are quite obvious: a map is a conventional signed model of the Earth surface, in most cases requiring special skills to be able to read it. Satellite images give a more user-friendly and updated presentation of geo spatial information. It should be always kept in mind though

that the space imagery data open unlimited possibilities to the specialists for thematic interpretation.

Operationally updated seamless mosaic image coverages became the foundation of a geoportal as the most effective solution to resolve the problem of geoinformatics introduction into governmental structures, public life and commercial companies.

Popular foreign open commercial geoportals, such as Google Earth/Google Maps, MS Virtual Earth, Yahoo! Maps using remote sensing data are well-known worldwide. Google Earth is an example of a user-friendly and useful service for distribution of geospatial satellite imagery data with Internet access and evident advantages: one can easily search and visualize images, build and store archives of satellite imagery, combine the imagery with additional semantic information enabling their analysis and decision-making, etc.

A user-friendly format and huge capacity of geoportals make them attractive not only for large corporations and government agencies: some governments are building nation-wide geoportals. For example, France built a country-wide service (covering French overseas departments) on the basis of earth imagery from French satellites and more detailed aerial photography. However, the images of military facilities and bases have been deliberately blurred out. After some security issues have been settled, French geoportal data has become available not only to government and public, but to the world at large. Canada is building a similar geoportal.

Today, we can mark out two Russian Internet-project, offering geospatial data services: maps.yandex.ru (Yandex Maps) and kosmosnimki.ru, with satellite images being prepared by the specialists of ScanEx R&D Center.

Innovative conceptual solutions and software expanded Google Earth applications beyond purely cartography over all aspects of human activity: business, management, R&D, everyday life. However, a lot depends on the baseline information that is earth satellite imagery and geospatial products made out of them.

Satellite-based data represent geospatial information in great demand by the public. They also serve as a unique basis to distribute different spatial information and to generate various customer services.

No geoportal can be operated without a map. The basis for a map's raster coverage is satellite images stitched into a single color-balanced mosaic. The mosaics are created based on medium resolution images with pasted-in high-resolution images of the largest human settlements and industrial centers.

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Kosmosnimki geoportal (Fig. 1 and 2) is a “test site”, where ScanEx Center specialists develop own remote sensing data display technology as the basis of geoportals and design multiple add-on modules capable of meeting all possible demands of the customer.

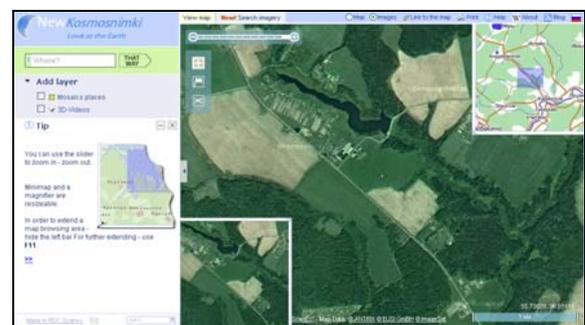


Fig. 1. Kosmosnimki geoportal: IRS satellite images with 5.8 meters resolution.

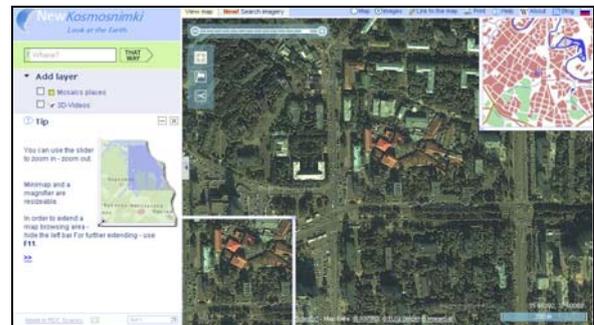


Fig. 2. Kosmosnimki geoportal: IKONOS satellite images with 0.8 meters resolution.

The unique feature of Kosmosnimki geoportal is operational updating of satellite imagery due to the fact that ground receiving station forms the basis of geoportal. On Fig. 3 there is the scheme how geoportal Kosmosnimki works.

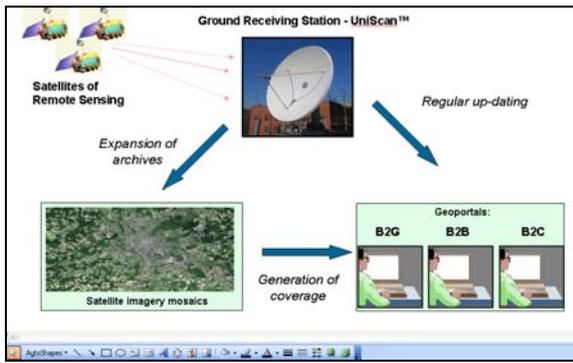


Fig. 3. Kosmosnimki geoportal: unique feature is operational up-dating of satellite imagery.

UniScan™, designed and manufactured by R&D Center ScanEx is universal groundreceiving station that enable to acquire images from wide range of Earth observing satellites (Fig. 4).

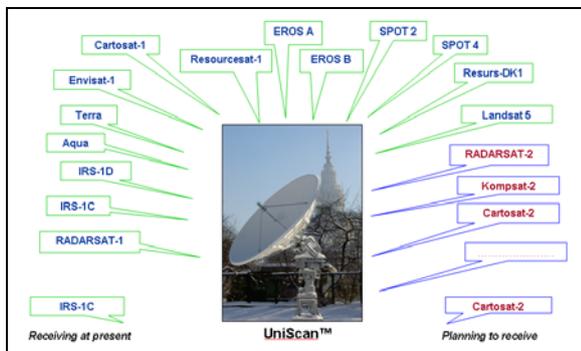


Fig. 4. UniScan™ ground receiving station.

To date, SCANEX R&D Center, having a network of its own ground receiving stations (Fig. 5), can provide for a complete coverage of the Russian and CIS territory with updated satellite images at 5.8-10 m resolution (2006-2007) with individual highly detailed populated and industrial areas at 0.7-2.5 m. At the same time the baseline coverage at middle resolution, with VHR data available for the areas of interest, can be fully updated within 2-3 years.



Fig. 5 Commercial of UniScan stations, operated by ScanEx

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