



# DEVELOPMENT OF RUSSIAN GEOPORTALS: KOSMOSNIMKI.RU

POWERFUL EARTH OBSERVATION IMAGE PROCESSING AND GEOPORTAL VISUALISATION TOOLS HELP RUSSIAN ADMINISTRATIONS MONITOR SITUATION DEVELOPMENTS IN NEAR REAL-TIME

Application of space imagery and space imagery-based geoservices has been expanding year by year. Some countries open their own national or regional geoportals. Russia became one of them when, on February 13, 2007, specialists of the ScanEx Research and Development Center launched the on-line project "kosmosnimki.ru", a geoportal with base coverage tailored to the use of 5.8 meter resolution images (data from the Indian IRS satellites) and currently including the Central, Southern and Privolzhsky Federal Districts as well as the Kaliningrad and Leningrad Regions. As of today, the total area of IRS mosaic amounts to approximately 2.5 million sq. km. Highly-detailed IKONOS data are also available (0.8 m resolution) for the largest cities of Russia. The global world coverage is created using LANDSAT-7 images (15 m resolution).

The kosmosnimki.ru project is a continuously updated map service, which provides users with access to on-line maps and associated tools. The website hosts an independent page - the on-line shop - where anyone can purchase fragments of mosaics of interest and available on line.

The technological solutions of the kosmosnimki.ru project (interactive map representation via the web interface with attributive search) were implemented in the web-platform for the cartographic service Карты@Mail.Ru 2.0. Additionally, mosaics were created for the Moscow and Leningrad Regions (SPOT 4 at 6 m resolution) and Moscow City (KOMPOSAT, 1 m resolution).

An important milestone in accessing geospatial data in Russia was achieved at the end of 2008 when the API service was opened on the popular Russian Internet map search site Yandex.Maps. The service offers the most detailed (at the time of publication) map of Russia posted on Internet, a set of satellite imagery mosaics for Russian cities and CIS

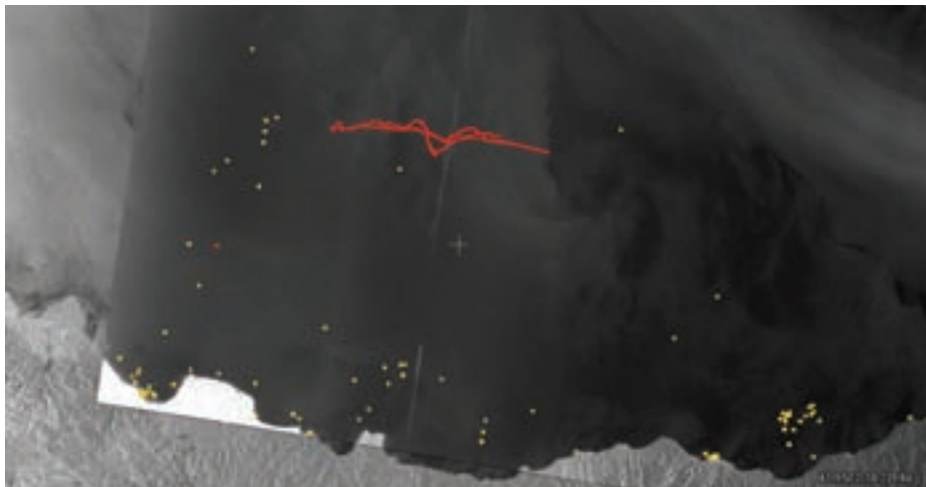


Figure 1. Vessel spill (marked in red) within the responsibility zone of Turkey, ENVISAT-1, 28.10.08 (ESA, ScanEx, 2008)

countries with spatial resolution of up to 80 cm (data from IKONOS, mosaics provided by ScanEx), as well as the opportunity to search in the toponymic database. By virtue of the new API service, users may create public websites and embed interactive maps and satellite images in their web pages without restrictions.

Capabilities of the kosmosnimki.ru geoportal can be used in development of regional or specialized geoportals. For instance, following the request of Emercom of Russia, a geoportal was constructed for prompt publication of satellite imagery results obtained over emergency and natural disaster areas. As requested by the Administration of the Novorossiysk Sea Port, the "Kosmosnimki – Black Sea" geoportal was developed in August 2008. The geoportal allows prompt delivery of satellite data to the services reporting to the Captain of the Novorossiysk Port to reflect situations in the controlled area, with indication of vessel coordinates and oil slick locations being detected while processing satellite imagery data. Thanks to the geoportal, information supply terms (the period from the imagery acquisition to the end product delivery to users) are from 40 minutes to 2 hours.

Simultaneously with satellite imagery acquisition, the Novorossiysk port services document the situation in the harbour using coastal and ship-mounted assets, identify vessels involved in detected pollution events and carry out investigations required by international conventions. While the process of detecting polluters has been standard practice for many years in Europe, until recently, Russia has not had at its disposal the technologies for prompt on-line space information delivery to customers.

In addition to the Novorossiysk harbour area and access routes, the entire area of the Black sea is monitored for oil pollution. The analysis of radar images demonstrated that the primary pollution sources are vessel spills, in particular ballast and bilge water dumping along sea routes. The largest vessel spills in the Black Sea over the entire monitoring period were registered within the responsibility zones

of the Ukraine and Turkey (See Figures 1 and 2.)

Please remember that, starting in March 2007, EU countries introduced penalties for vessel pollution of sea areas and have been exercising planned pollution monitoring of the seas around Europe using RADARSAT-1 and ENVISAT-1 satellites via the CleanSeaNet service. The eastern and central parts of the Black Sea, under the responsibility of Russia, the Ukraine, Turkey and Georgia, are not covered with regular satellite monitoring via the CleanSeaNet service. Therefore the project of ScanEx RDC and the Administration of the Novorossiysk Sea Port was the first attempt in arranging an operational service within the region in question.

The present stage of the kosmosnimki.ru project development is defined by the ScanEx Web GeoMixer® technology. This allows combining various data types in one on-line project, working simultaneously with raster and vector formats, connecting metadata bases and searching through these data bases. The functional package of geoservices built on the basis of this web technology is capable of resolving different social and economic tasks.

Presently kosmosnimki.ru use Java Script as its primary technology. The new Flash-supported version of the kosmosnimki.ru website, based on the ScanEx Web GeoMixer® technolo-

gy, will allow increasing the number of vector objects (points, lines and regions) to be simultaneously displayed on the screen to several thousand without significant redrawing delay. This in turn, will allow showing vector layers of significant size, editing shp-files, which, for instance, will greatly facilitate visualization of users' GPS-tracks in a web browser.

Development of geoservices offers great opportunities for analysis, planning and support of the decision making process at local and regional levels. The application range of web-GIS technologies is wide in this area - from simple marking of boundaries of different types, creation of construction databases for settlements, to defining infrastructure development prospects of a city or entire region.

Projects combining data of different types (images, thematic layers and databases) are an integral part of ScanEx RDC developments and products. The company offers both the content part of geoportals (satellite mosaics, maps, etc.) and development of thematic products and visualization of on-line data.

ScanEx Research and Development Center (ScanEx R&D Center) is the leading Russian company in the remote sensing market offering a complete range of services, ranging from acquisition to thematic processing of Earth observation images from space. ScanEx is the only Russian company with signed license agreements with the top global remote sensing operators for direct data acquisition from the **IRS, SPOT, EROS, RADARSAT** and **ENVISAT** satellites series to UniScan™ ground stations, enabling regular, near real-time monitoring of the territories of Russia and the CIS countries with spatial resolution from hundreds of metres to less than one metre.

URLs – IKONOS data from ScanEx:  
[http://www.scanex.ru/ru/data/default.asp?sub  
 menu=ikonos&id=index](http://www.scanex.ru/ru/data/default.asp?submenu=ikonos&id=index)

Article by M. Potanin, Head of "Kosmosnimki" Group of ScanEx RDC, S. Zaychenko, Specialist of ScanEx RDC on Support and Development of Cartographic Services, [www.scanex.ru](http://www.scanex.ru)

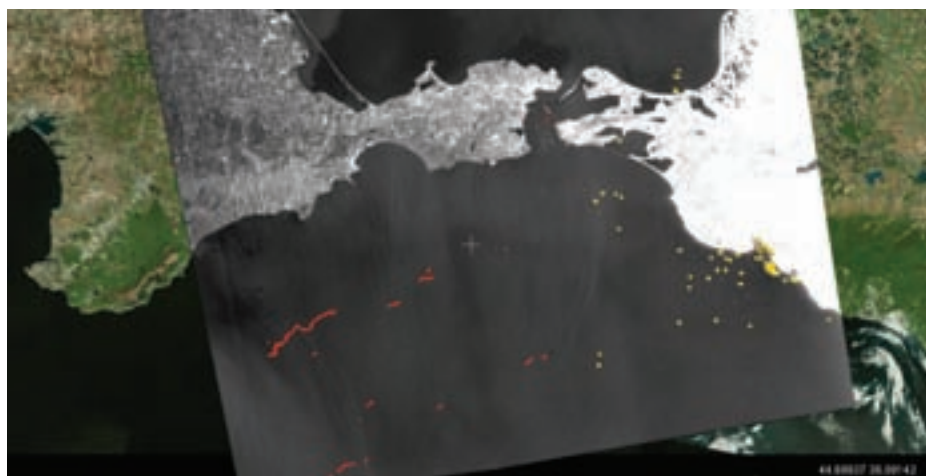


Figure 2. Vessel spill (marked in red) within the responsibility zone of the Ukraine, ENVISAT-1, 19.08.08 (ESA, ScanEx, 2008)