Fire Monitoring by Satellite

Testing of the operational ScanEx Fire Monitoring Service (SFMS) has been started. The service has been developed at the ScanEx Research and Development Center and unlike similar systems (e.g., NASA Rapid Fire, AFIS, etc.) it offers access to data of several satellites of low, middle and high resolution.

For the purpose of the project daily satellite imagery of the Russian territory is carried out with the data received at UniScan ground complexes, deployed in Moscow, Irkutsk and Magadan. At the first stage of the service testing in July only data of the European part of Russia will be used (within the footprint of the UniScan station, installed in Moscow).

ScanEx Fire Monitoring Service web-service is intended for operational reception of satellite data about the fire areas location on the Russian territory and about the assessment of burnt area and the damage incurred. In SFMS web-service the data over the past four days is displayed with daily data updating as appropriate.

Fire areas are detected based on the MODIS sensor data which is the key instrument onboard the American Terra and Aqua satellites. The sensors' sensibility enable to detect forest and steppe fires of 1ha and more in size. As a result of processing geolocated images one may delineate burning areas within a region of 1x1km in size. The SFMS service ensures the possibility to view raster images in Google Earth, synthesized in natural colors from optical MODIS bands, which enables to assess the location of the cloud cover and the possibility to detect fires in the AOIs being monitored.

To expand the monitoring possibilities the project applies detailed multispectral images from SPOT 4 satellite (resolution of 20 m/pixel) and Landsat-5 (30m/pixel), which enable to monitor the aftermath of fires and to plot the burnt areas. Detailed information on SFMS service is displayed in form of overview of all SPOT 4 and Landsat-5 passes, received by UniScan ground stations of the ScanEx's network. Using service tools the user may select and order low-cloud detailed images of the monitoring areas, where MODIS sensors detected fire areas.

SFMS service data can be used not only for fire detection and monitoring, but for monitoring of other "hot targets" as well, for example, flares on oil and gas fields.

Popular Google Earth web-mapping service is used to get access to the service. Any one may connect to the fire information service by adding http://catalog.scanex.ru/sfms.kml link to the Google Earth application. When this link is updated, the latest information is loaded into Google Earth: data about the location and properties of the detected fire areas, wide FOV MODIS images and quicklooks of more detailed SPOT 4 and Landsat-5 images. Data is grouped into sections sorted out by four last monitoring days, which enables tracking both operational situation for current day and do the retrospective analysis of the situation changes for the past three days. In addition, the users can add own data, integrating them with the existing information about fires for joint analysis and decision-making.

For the registered users a number of additional options is offered on displayed data control:
- to define own areas of interest and to select fire data only within its limits;
- to change "hot targets" detection thresholds;
- to define own criteria of fire selection based on the detection authenticity degree, to perform classification and scrapping of "hot targets".

Access to MODIS data, SPOT 4 quicklooks and Landsat-5 data on SFMS service is free and open. The users who register will get an opportunity to set up threshold values of the "hot targets" detection program and will be able to order SPOT 4 and Landsat-5 images on-line at special prices.