Building wealth from the air

by Andrey Nikiforov

The history of the Republican Agricultural Aerophotogeodetic Unitary Enterprise (BelPSHAGI) goes back to 1950, when the West Aerophotogeodetic Enterprise of the Soviet Union office 'Selkhozaerosyomka' of the Ministry of Agriculture of the USSR was established. At that time, the company carried out full-cycle field and aerophotogeodetic works to create plan-and-cartographic materials, which was indispensable for land management of collective and state farms (kolkhozs and sovkhozs) in the Republic of Belarus, the Baltic Republics, as well as Kaliningrad and Smolensk regions of Russia.

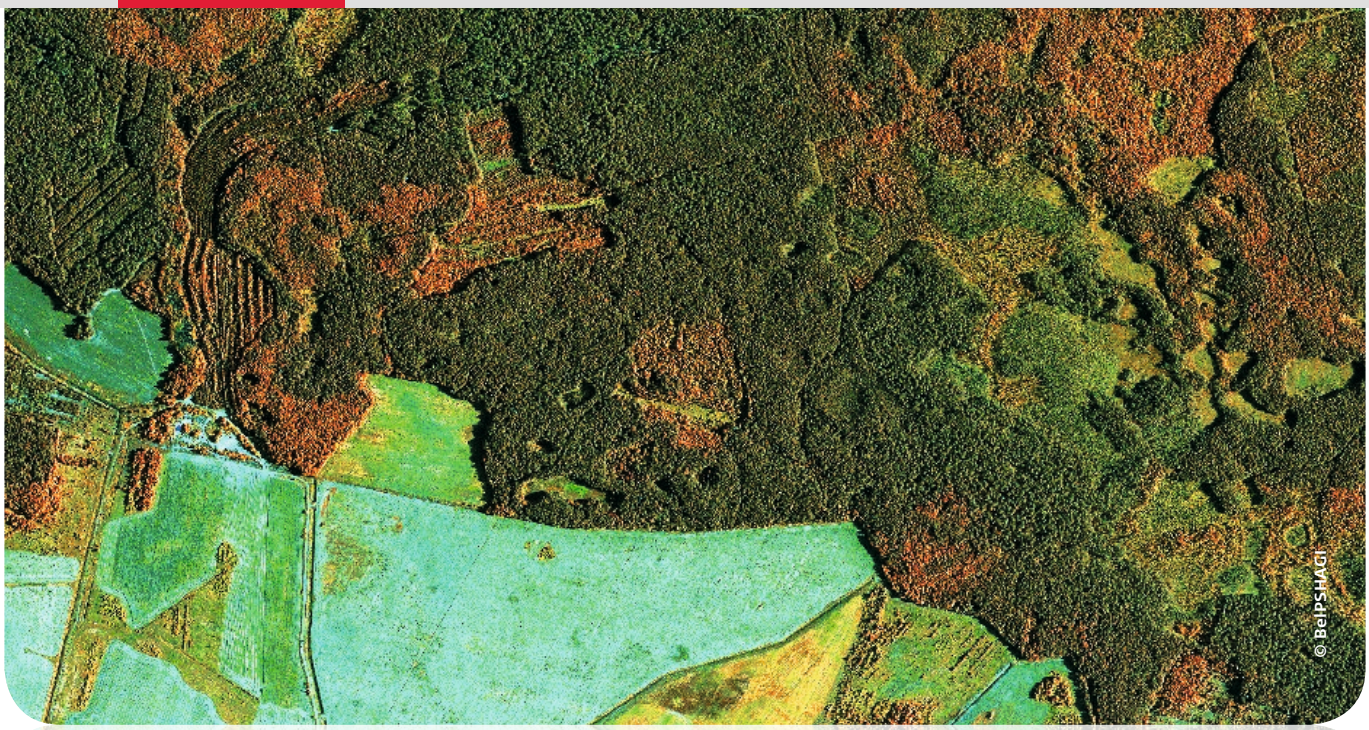
Today, BelPSHAGI is an enterprise equipped with state-of-the-art facilities and employs a highly skilled staff. The organisation renders services in geodetic cartography and planning, mainly creating and updating state topographic maps as well as regional graphic, digital, photographic and other types of plans. Furthermore, it also processes GPS survey data to create and maintain state geographic information systems (GIS) and cadastral registers. The BelPSHAGI also establishes and develops planning and terrain survey networks.

BelPSHAGI is the only enterprise in the Republic of Belarus that can deliver high-resolution imagery using airborne imaging sensors.

The launch of the digital era

In 2013, the company purchased a new ADS100 Airborne Digital Sensor from Leica Geosystems. This equipment has made it possible to expand remote sensing applications used by BelPSHAGI to forestry and land management and offer services to topographic and geodesic companies.

The Leica ADS100 can also be used to develop and introduce environmental applications or for emergency protection. Data collected enables evaluating the qualities of reclaimed soils or assessing the effi-



Aerial imagery for agricultural and forestry interpretation.

ciency of anti-erosion measures. This includes the success of protective forests planted on reclaimed soil, based on the analysis and thematic processing of alternative digital aerial images and selective ground-based measurements. Today, the imagery provided by the Leica ADS100 is also used for assessing agricultural areas within a range of parameters, and reflects the state of the reclaimed objects such as soil. These assessments have a direct impact on crop yields and ecological position of territories.

A variety of applications move Belarus forward

In 2015, use of state geographic information technologies and Leica ADS100 remote sensing enabled the organisation to create soil maps determining the requirements needed for organic and mineral fertilisers used in precision agriculture. As a result of this variable rate technology, fertilisers could be reduced by 20 percent.

At present, high-resolution imagery obtained from Leica ADS100 provides the basis for the Unified Infrastructure of Spatial Data of the State Committee on property of the Republic of Belarus. Experience indicates, with widespread usage of geo-information technologies, the value of spatial data and also the awareness of its true significance, is constantly growing. The same holds true for its application in numerous other areas. For instance, images produced by the aerial sensor are now widely used as a geospatial basis for immobile assets inventory, for the provision of cadastral works, for city planning or for the creation of prospective development schemes of diverse territories.

Today such information resources as the Geoportal, a land and information system of the Republic of Belarus, and the public cadastral map of the Republic of Belarus provide more detail and are continuously updated. The basis for these resources also consists of orthophoto maps captured with the Leica ADS100.

Forest health surveys

After commissioning the Leica ADS100, forestry experts receive data with a spatial resolution of 30 cm (1 ft), 16 bit. The data is of very high quality

■ **Multispectral image taken over Minsk helping to assess forest health.**

and makes it possible to tackle issues concerning thematic processing of remote sensing and geo-information analysis. Up-to-date methods of decoding and analysis of aerial surveys enabled BelPSHAGI to achieve its goals, regardless of the degree of complexity or spatial and time conditions.

Managing the inventory of these forest ranges, including the spotting of fallen and damaged trees, the monitoring of usage and the overall condition of forests, including the identification of clear-cutting, as well as the selective cutting and initial forest fires, are only some of aspects which can be studied from the data collected by the airborne digital sensor for thematic projects.

Using the Leica ADS100, more than 50,000 square kilometres (19,300 square miles) of forest land territories images have been taken. Experts from the National Forestry Enterprise 'Belgosles' praise the image data the Leica ADS100 delivers, which not only supplies high quality imagery but also complies with best global practices. Currently, this information is a part of the data pool from the 'State Forestry of the Republic of Belarus', Geographical Information System 'Forest Monitoring' and Geographical Information System 'FORMOD', which are part of the information base of the State Forestry Register.

Developing Kobrin with detailed aerial imagery

For the first time in the history of Belarus, an aerial survey using a spatial resolution of 5 cm (2 in) was made of the town of Kobrin in the Brest region. This survey was carried out within the framework of a pilot project of wide-scale formation and property cadastral valuation in 2014.

Kobrin town and Kobrin district will become the first places in the Republic of Belarus, in which total inspection and recording of immobile assets and objects of taxation will be accomplished. As a result, the recording of allotments, real property items, the creation of territory and real estate property management in the form of a GIS, the analysis of the current taxation system, and its development prospects will be implemented.

The Leica ADS100 has given impetus to the development of a new activity in the Republic of Belarus, namely three-dimensional city modelling. Undoubtedly, the product will also find its application in engineering, city planning, housing maintenance and utilities, or law enforcement.

BelPSHAGI would like to stress that Leica ADS100 complies with the up-to-date standards. The device fully complies with its specification sheets and proves to be extremely reliable in operation. ■

About the author:
Andrey Nikiforov began his career in 2003 at the Belarusian Land Management Organisation. After, he became head of the Land Management Department at the Land Ministry. As of 2013, Andrey is director of BelpsHAGI.

News »

DMC User Group Meeting in China marks success

The 2015 DMC national user conference was held successfully in the National Surveying and Mapping Innovation Base May 22 in Beijing. This conference was co-hosted by Hexagon Geosystems and Beijing Siwei Spatial Data Technology Co., Ltd. About 200 people attended the conference, including leaders and experts from provincial land bureaus, bureaus and institutes of surveying and mapping, and relevant departments throughout China. The meeting was held to learn about the latest technical innovations and trends of the DMC airborne image sensors and software. Participants had the opportunity to network and share their experience and successful stories.

Leica Geosystems Singapore sales office opens

Leica Geosystems solutions have historically been offered in Singapore under the DKSH Technology Business Unit. Leica Geosystems Singapore Office has now created its own sales company in the country and acquired relevant assets from DKSH Technology.

Leica VADASE – delivering fast structure movements in real time

Running onboard the latest Leica Geosystems reference stations and monitoring receivers, Leica VADASE provides an in-depth look into fast movements using unique processing algorithms. In real time, accurate high-rate velocity and displacement information of various activities and structures are provided to engineers and researchers for a complete, precise and reliable monitoring solution.

Faster delivery of digital realities

In October, Leica Geosystems teamed with NCTech, a developer of reality imaging systems, to deliver automated, colourised 3D point clouds for enhanced usability and clarity. In Leica Cyclone, 3D point cloud processing software, users can now automatically import and align high-dynamic range data from NCTech's iSTAR camera database, producing enhanced deliverables quicker and easier.