Organization of training course "Aerospace methods in forestry and landscape design" in Sochi State University using PHOTOMOD System

K.N.Makarov, professor
Sochi State University of tourism and health resort business, Russia

From 2004 in Urban design department of Sochi State University of tourism and health resort business, training course "Aerospace methods in forestry and landscape design" has been started. This subject is included into State Educational Standard for profession #250203 "Garden and landscape design", which is accredited at university. The subject studying has following purposes:

- to bring students common information on the whole complex of aero-geodetic works, performed during survey, design, building and exploitation of forest-park farming, including aircraft types, images photogrammetric processing features, airborne images recognition, using of GIS technology;

- to teach students modern computing methods of creating and using of topographic data and digital terrain models (DTM) created by airborne and space borne images.

After this training course student should obtain an experience and skills in stereo photogrammetric processing of stereopairs, then use them for topographic maps and digital terrain models creation, evaluation of land and vegetation by terrain stereo models.

The subject studying is organized in lections and practice works. Here are the main parts of the training course:
- airborne survey – types, purposes, equipment, ground control points, aerial survey organization, photofinishing works;
- stereo photogrammetric processing of airborne data – images orientation parameters, images scale, photo triangulation, images rectification and recognition, topographic maps and digital terrain models creation by airborne images;
- ground-space terrain survey – basic concept on satellite navigation systems (GPS), ground control points coordinates obtaining using GPS, geodetic works using basic GPS stations;

- remote sensing of environment – functions and features of remote sensing methods, aerial and radio space sensing, aerial radar and laser sensing, current and prospective remote sensing systems in our country and abroad.

Practical training is of two types: calculating tasks and practical work with PHOTOMOD demo version. Calculating tasks include the following:

- detection of main airborne survey parameters – camera focal length, average flight height, absolute flight height, images and strips overlap, survey width, distance between adjacent strips, air base, number of images in strip, number of strips, total images amount, needed film length, survey time, camera exposure, time period between exposures;
- measuring of DTM points coordinates - rectified, photogrammetric and geodetic using processing data;
- measuring of DTM points geodetic coordinates, rectified considering model deformation.

In that way calculating tasks allow students to perform manually the part of work, which PHOTOMOD system performs automatically.

After manual calculations students perform aerial images pair and strip processing in PHOTOMOD system. They pass the whole procedure step by step accompanying by detailed descriptions of each step by lecturer.

It is necessary to say, that PHOTOMOD system is extremely effective tool to demonstrate the whole process of aerial data processing and using it for topographic mapping and DTM creating.

However PHOTOMOD system is used in teaching process in some simplified mode, just for demonstrations. That is why from our point of view it is necessary to develop a textbook for students of building and geodetic universities using PHOTOMOD system manuals and documentation.