



Report from the business trip in China

Between November 3rd and 14th, 2013, Dr. Ing. Tomáš Bucha, Ing. Milan Lalkovič, PhD. and Mgr. Ivan Barka, PhD. from the National Forest Centre (NFC) Zvolen, Slovakia, made a business trip to the People's Republic of China. The business trip was realised within the joint project financed by the Slovak Research and Development Agency SK-CN-0008-12 Innovative methods of monitoring forest fires and mapping the changes in forest conditions using remote sensing tools.

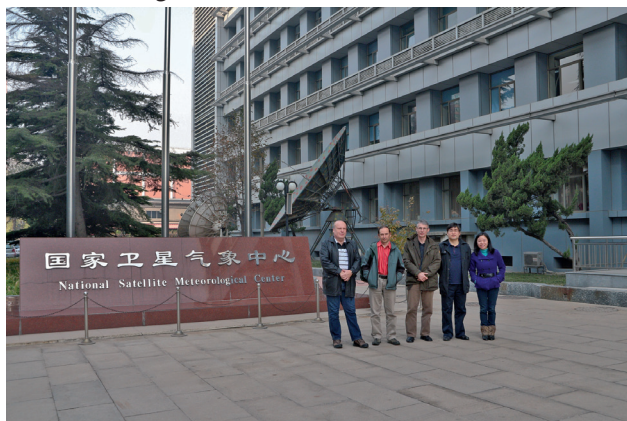


Fig. 1. Visit in the National Satellite Meteorological Center in Beijing.

The goal of the project is to deepen the cooperation between NFC Zvolen and the *Chinese Academy of Forestry (CAF)* Beijing in remote sensing applications in forestry. The project will include the exchange of experts, study tours and the organisation of the joint workshop.

The aim of the business trip was:

- To obtain personal contacts to the experts working at Chinese universities and research institutions, whose research activities are focused on the applications of remote sensing in forestry,
- To present the state and the level of this research area in Slovakia to the Chinese experts, and to introduce NFC as a prospective partner for a wider international scientific cooperation,
- To obtain the material for a feasibility study of satellite images from Chinese satellites for forestry needs in Slovakia.

The project leaders in Chinese side **Prof. Haoruo Yi** and **Prof. Ping Ji** prepared an extensive business program consisting of workshops, working visits of relevant institutions and the cultural sightseeing program during the weekend. The basic intention of the business trip was to obtain the information on using progressive remote sensing technologies for monitoring forest fires, forest inventory, and mapping of forest landscape affected by human-induced management activities and disturbance events. However, the business program allowed us to learn about the remote sensing applications more broadly, to become familiar with the meteorological applications, applications directed for the use in environmental sciences, physical geography, and global natural changes. The program also included the introduction into the research in the area of space technologies and the visit of the air and space museum.

The workshops were organised at the Chinese Academy of Forestry (CAF), the Research Institute of Forestry and Information Technologies. The activities of the institute were presented by its executives. **Prof. Zhang Naijing** and **prof. Yundan Xiao** informed us on the Chinese Forestry Scientific Data Centre as well as on the Organisation of the National Infrastructure for forestry research data including the user service through web interfaces.

Prof. Chen Erxue gave us an introductory talk on the research activities of Remote sensing department in the area of utilising radar and Lidar systems. **Prof. Qin Xianlin** presented a system of fire monitoring, determining fire risk, and fire mapping in China. They use the satellite data from NOAA-AVHRR (1.1 km), MODIS (250 m), ENVISAT-MERIS (300 m), FY 3A/B MERSI (250 m), HJ-1A/B CCD (30 m) and CEBERS CCD (20 m). The senior scientist **Zhi-hai Gao** thoroughly described the utilisation of remote sensing techniques for assessing the desertification process of China. **Associate professor Pang Yong, Li Zengyuan,** and **Liu Qingwang** presented us Lidar applications in forestry. the *Chinese Forestry Scientific Data Centre (CFSDC)* of CAF manages the data on <http://www.forestdata.cn> divided in eight thematic units: 1. Forest resources; 2. Forestry ecologically-environmental data; 3. Forest protection; 4. Forest silviculture; 5. Wood processing and technologies; 6. Forestry scientific literature; 7. Specialised data on forestry science and research; 8. Data on forestry development. More detailed information on Chinese science and technologies is available on the following web site: <http://www.escience.gov.cn/eng/index.html>.

Slovak participants of the business trip presented their reports on the workshop organised at CAF with the following titles: Remote sensing at NFC Zvolen, infrastructure and services based on remote sensing data (T. Bucha); Remote sensing applications for studying forest dynamics (T. Bucha); Remote sensing applications for assessing forest fires (M. Lalkovič); Aerial remote sensing, utilisation of multispectral images and first experience with Lidar data (I. Barka).

Apart from the host organisation we also visited the Institute of geographical sciences and natural resources research (IGSNRR) of the Chinese Academy of Science, and its *State Key Laboratory of Resources and Environmental Information System*. **Prof. Wang Juanle** and **Zhu Yunqiang** presented new attitudes towards the collection, management, and utilisation of data about landscape in the presentation “From sharing geo-data towards e-Geoscience”. The laboratory belongs to the network of scientific laboratories directly financially and organisationally supported by the government. Their task is to maintain the national system of environmental data sharing between research organisations, universities, and other institutions. This information system contains national-wide databases (particularly spatial layers with the information on environment in large scales, e.g. time-series of layers of the Earth exploitation in the scale of 1:100 000, soil types of China in 1:1 000 000, etc.), as well as meta-data owned by individual users including the description of data accessibility and contact information of

data owners. Thus, the system allows efficient data sharing and exchange between users, and can be extended by further algorithms necessary for deriving new data from the existing ones. The system is open to the scientific organisations free of charge, but can also be accessed by private organisations for a fee.

Similarly, *National Satellite Meteorological Centre* provides a data access platform (<http://satellite.cma.gov.cn>) to meteorological and other Chinese satellite data. In the centre we gained the information about the access to FENGYUAN satellite data. After the return to Slovakia we realised the administrative procedure of registration and obtained the access to the data of this database at the highest level as “advanced users”.

We also visited the *Institute of Remote Sensing and Digital Earth* of the Chinese Academy of Science, to which the *State Key Laboratory of Remote Sensing Science – SLRSS* organisationally belongs. Basic information about the laboratory was given to us by prof. **Shi Jiancheng**. Prof. **Meng Qingyan** presented the *Application system of remote sensing* that integrates the data from several satellites and the digital data on landscape. The visits of the mentioned institutions showed us that the Chinese partners pay exemplary attention to the accessibility of the data obtained within the solution of state tasks and projects. In all cases we encountered high quality of instruments, experimental and computer facilities equipped with large-format (wall) displays for presentation purposes. The institutions can overall be characterised by excellent conditions in offices and laboratories supported by modern infrastructure of buildings, pleasant (usually fenced and guarded) environment of campuses and areas of visited universities and research organisations.

The hosts treated us with great cordiality, and hospitality that allowed us to visit top institutions and their laboratories, and to get the best impression from the presentations.

Another interesting and typical feature of the visited institutions is a great number of young workers. They are mostly students, postgraduate students or post-doctoral scientists,



Fig. 2. Presentations and discussion at the Chinese Academy of Forestry.

who work not only at universities and academy institutions, but also at so called “branch” institutions, such as the receiving organisation – Chinese Academy of Forestry (CAF), which is organisationally placed under the *State Forestry Administration*. The difference between CAF and NFC, or the whole scientific research base of Slovak forestry, is that CAF is authorised to train postgraduate students due to the applied higher education system and the possibility to create post-doctoral positions that are subsidised by government. Also in this aspect, the generosity of state support for science and research certainly pays and explains the high rate and the progress level of Chinese forestry science.

At the end it is necessary to note that the planned visit of the Chinese delegation in Slovakia will take place at the end of April and the beginning of May 2014. Slovak professional forestry community will have a possibility to meet the Chinese experts directly at the international conference “Actual problems of forest protection 2014”, within which NFC Zvolen will organise the accompanying workshop on remote sensing applications in forestry.

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