

## **The Komarów 1914 Project – Integrated geophysical research of the battlefields.**

In Polish historiography, the Battle of Komarów is better known as the battle fought in this town in 1920 by the Polish army and the Bolshevik army. It should be remembered, however, that 6 years earlier, during the First World War, the 5th Russian Army and the 4th Austro-Hungarian Army faced each other in this area. During the first two days of the battle, the army of General Paweł von Plehwe repelled the attacks of the Austro-Hungarian troops, led by General Moritz Auffenberg, but on August 28 the situation changed, and in the night of September 1-2 the tsarist troops retreated towards the Bug River. To this day, especially in the forests, relics of those fights are visible in the form of trenches, dugouts, firing pits and artillery craters of both armies. A large part of this type of features was also located in the open area, but was levelled due to the passage of years and agricultural activity.

The field of archaeology that deals with the study of relics of military conflicts is the archaeology of battlefields, which develops rapidly since several decades, mainly in the United States, Great Britain, France and Belgium. However, no effective methodology for conducting this type of research has been developed so far, and thus the potential of a non-invasive archaeological research has not been fully used.

The goal of "The Komarów 1914 Project – Integrated geophysical research of battlefield" is to develop an optimal methodology for conducting a non-invasive research on battlefields. For this purpose, modern archaeological techniques will be used, such as: geophysical prospection (magnetic, electrical resistivity imaging and tomography, GPR) and remote sensing imaging (satellite, thermovision and multi-spectral with the use of a drone, LiDAR data).

To achieve this goal, it is assumed: (1) conducting a detailed bibliographic and archival query, which is necessary to create a spatial database enabling correlation with data obtained during the non-invasive research, (2) development and analysis of a digital terrain model of the study area (100 km<sup>2</sup>), (3) conducting surface surveys supported by GPS technology to verify the recorded features, (4) selecting of polygons and conducting the preliminary geophysical surveys, (5) developing a methodology for conducting integrated geophysical surveys using magnetic, electrical resistivity imaging and tomography, GPR, (6) carrying out broad-scale geophysical surveys using the developed methodology supported by remote sensing with the use of UAV, (7) developing the results of geophysical surveys, determining the most effective non-invasive survey methods in specific field conditions.

The implementation of "The Komarów 1914 Project" gives a unique opportunity to develop the best methodology for the battlefield research with the use of integrated geophysical techniques, and will allow the recognition of the preserved relics of the 1914 Komarów battle. The use of integrated geophysical methods and remote sensing imaging in area of struggles will enable the reconstruction and localization of unknown lines of defence and will allow obtaining information relating to small, sometimes single episodes of skirmish, which were not reflected in official historical sources. In addition a digital GIS database will be developed, integrated with the Poland CS92 coordinate system, containing historical maps, contemporary topographic maps, DTM models, maps from non-invasive surveys, information on the location of military features, their functions and the state of preservation, which will allow conservation services to make further decisions on the protection of the battlefields.