

# High resolution elevation data in Poland

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**Abstract**—Governments around the world undertake many countrywide projects and initiatives to increase public safety using geospatial data and latest achievements in ITC sector. This paper present polish effort to collect and deliver high resolution elevation data for flood risk and hazard mapping process and hints regarding elevation data utilization in other sectors of polish economy.



Figure 1. Example of flooding areas visualization.

## I. INTRODUCTION

Directive 2007/60/EC on the assessment and management of flood risks imposes upon member states the obligation of preparing flood hazard and flood risk maps until the end of the year 2013.

To meet those requirements polish Government launched project ISOK - Informatic System for Country Protection against extraordinary hazards. ISOK is implemented by the consortium consisting of Water Management Board, Institute of Meteorology and Water management, Head Office of Geodesy and Cartography, Communication Institute and Government Center for Security. One of crucial tasks is to establish new dataset of high resolution elevation data indispensable for production of flood hazard and risk maps. Utilization of those maps in combination with other datasets will influence spatial planning in Poland strongly and in result increase safety of people and infrastructure in following years “Fig.1”.

## II. DATA PRODUCTION AND APPLICATIONS

From the March 2011 GUGiK signed 33 contracts with companies from Poland, USA, Portugal, Germany, Holland, Slovenia for acquisition ALS and production of DTM/DSM covering 289'000 km<sup>2</sup> (93% of polish territory). During 4 years of production campaign more than 1,3 trillion ALS points will be measured which states more than 10'000 points per each second of campaign. ALS data are collected in two standards: I standard 4 points/m<sup>2</sup> covering 275'000 km<sup>2</sup> and II standard 12 points/m<sup>2</sup> covering 14'000 km<sup>2</sup> - (94 cities).

ALS is collected mainly during off leaf season which means that weather plays a crucial role and only over a dozen of flight days are available for contractors during a year. Process of elevation data quality control is also outsourced so GUGiK is responsible for tendering procedure, contracts supervision, final step of quality control and data delivery to ISOK project consortium partners.

Before end of December 2014 more than 270'000km<sup>2</sup> of ALS/DTM/DSM is already done and shared dataset is adopted not only for purposes of hydrological modelling by Institute of Meteorology and Water Management – National Research Institute but for many other applications like geological cartography (Polish Geological Institute – National Research Institute), archeology (Polish Academy of Science – “Fig. 2” presents discovery made by this organization on the basis of DTM) and many others. So far GUGiK shared almost 4 500 000 km<sup>2</sup> of ALS/DTM/DSM data for more than 700 institutions and companies in Poland. Applications in sectors of environment, security and crisis management states almost 70% of total data shared and the rest is utilized in sectors of big national geospatial projects, spatial development, education, science, tourism and sport.

There is a plan to finish full coverage of polish territory with high resolution ALS/DTM/DSM data before June 2016.

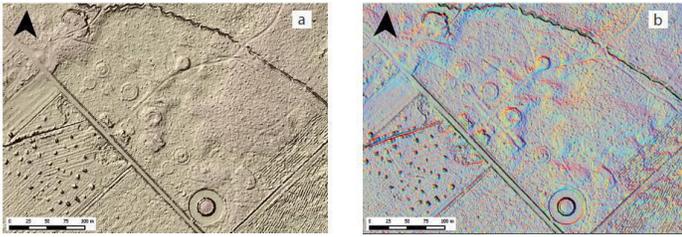


Figure 2. Antique cemetery: a) DTM shaded relief, b) PCA method visualization

#### ACKNOWLEDGMENT

Author would like to express great appreciation to ISOK project team colleagues in GUGiK, Adam Andrzejewski, Anna Marcinkowska, Marzena Kukiela, Piotr Walas, Edyta Kierys-Kukla, Anna Uziembło, Grzegorz Margasiński and Małgorzata Kaczmarczyk Koza. Successful production of high quality dataset of ALS, DTM and DSM for almost whole Poland in 4 years wouldn't be possible without their hard work and enormous engagement.

TABLE I. SHARE OF HIGH RESOLUTION ELEVATION DATA IN ECONOMY SECTORS

<b>Economy sector</b>	<i>Data shared in km<sup>2</sup></i>	<i>% of total share</i>
Environment	1 560 654	35,4
Security and crisis management	1 444 384	32,8
Geospatial projects	948 702	21,5
Spatial development	391 794	8,9
Science	57 928	1,3
Sport and tourism	4 157	0,1