

## Abstract template for the conference “A century of national forest inventories – informing past, present and future decisions”

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On page two, you are asked to fill in your abstract in the format and font size indicated. Please remember to include authors affiliation information in the footer section of page two. The length of the abstract may not be more than one page including references.

<b>Abstract title:</b>		Evolution of data acquisition and information processing technology in Poland's NFI
<b>Take-home message:</b>		<i>Throughout the 15 years of its operation, Poland's NFI data acquisition and information processing system was designed, build, supported and developed in-house by a dedicated development team. This has allowed for optimal alignment of technology and inventory needs in the ever-changing environment.</i>
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<b>General topic, see website:</b> <small>(please double click on the check box and activate the relevant one)</small>	<input type="checkbox"/>	Improving future NFIs by learning from the past
	<input type="checkbox"/>	NFIs today and in the future
	<input checked="" type="checkbox"/>	Cutting edge and futuristic inventory techniques and technologies
<b>Preferred presentation form:</b>	<input checked="" type="checkbox"/>	Oral presentation
	<input type="checkbox"/>	Poster
<p><i>Abstracts will be reviewed by members of our scientific committee and you will be given information on decisions in due time after the submission deadline has passed.</i></p>		

# Evolution of data acquisition and information processing technology in Poland's NFI

*Andrzej Talarczyk, Longina Sobolewska*

**Introduction:** The Forests Act states that the State Forests Holding is obliged to carry out the national inventory of all the country's forests. The Forests Act entrusted with this task the Bureau of Forest Management and Geodesy (BULiGL) - a state-owned commercial company. The main objective of Poland's NFI is to assess the overall forest condition and its evolution on a large scale. The inventory is designed to provide reliable information on forests, independent from stand-wise inventory. Since the beginning, the NFI has been carried out using dedicated software build in-house, supporting all stages of information processing: data collection, field work supervision and verification, aggregations and calculations, reporting at various levels.

**Materials and methods:** A central element of the information processing system is a data warehouse implemented on Microsoft SQL Server relational database. Calculation routines have been implemented as stored procedures. The reporting system is based on Crystal Reports combined with server-side data pre-processing. Software used by inventory field specialists has been written in .NET Framework environment, mainly in C# (Windows desktop and Windows CE applications). The latest field solutions are designed for Android handheld devices and implemented using the multiplatform Xamarin framework.

**Results:** Data acquisition methods have evolved from paper-based data collection forms to handheld assisted data entry and automated measurements. At the beginning of NFII data was entered through the WISL-Karty desktop application. The first mobile solutions were Windows CE and Windows Mobile devices running WISL-mKarty software. Both desktop and mobile apps had common source code base written in .NET to ensure identical operation, especially of data checking routines. In NFII, plot layout plans were created separately using a dedicated GIS module implemented in Esri ArcView 3. Later on, sample plot plans were integrated with the desktop WISL-Karty software and recently in Android mobile solution. The data collection software has been constantly evolving. At the moment, several hundred data integrity checks have been implemented. Works are under way to develop a modernized data collection software WISL-tKarty for Android handheld devices. Data processing code has been implemented in T-SQL. Volume calculations formulas have been re-implemented in T-SQL based on older Visual Basic code, to retain compatibility with an older software solution used in the State Forests Holding for forest management planning. Major processing software overhaul was done in 2015, due to the change in the sample plot size introduced in NFI3. The reporting software was designed to make generating output tables as easy and automated as possible. There is also a separate application to automate ETL and data consistency checks routines. Recently, this software was extended to include a graphic user interface to manage data calculation workflow.

**Conclusion:** Throughout the 15 years of its operation, Poland's NFI data acquisition and information processing system was designed, build, supported and developed in-house by a dedicated development team. The technologies and solutions have been evolving in line with changes in hardware and commercial software, as well as internal needs and external requirements. This has allowed for optimal alignment of technology and inventory needs in an ever-changing environment.