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## DEVELOPMENT OF SEMI-AUTOMATED PROCESS TO ANALYSE DATA FROM THE FLEMISH FOREST INVENTORY AND SUPPORT PERIODICAL REPORTING OF RESULTS

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### ABSTRACT

The Flemish forest inventory was designed to meet a large number of monitoring targets related to forest composition and structure, biodiversity in forests, and quality and quantity of wood. The first inventory took place between 1997 and 1999. In 2009, the second forest inventory started as a continuous inventory, in which every year 1/12th of the forest plots are measured. Data analysis is challenging because of the complex design of the sampling units, combining various plot sizes and shapes to measure trees and vegetation cover, and line transects to measure lying dead wood. Furthermore, the monitoring design and variable definitions slightly differ between the first and second inventory. Finally, approximately 50% of the plots could not be relocated in the in the second inventory. In this case a new plot was established. We developed a semi-automated process to support quality assurance of data analysis and periodical reporting of the data. We started with a conceptual scheme giving insight in the relations between the different data sources necessary for the data analysis. Based on this scheme a database was constructed with variables directly related to the monitoring targets (such as wood volume per plot, presence of exotic tree species, etc... ) and variables that characterize the sampling process (such as whether a plot was relocated or not). The construction of the database is based on R-scripts which enables an update when new raw data become available. Next, we developed a set of example R-scripts for the actual analysis related to the monitoring targets, with special attention to data exploration and quality checks. For analysing differences between both inventories, we propose generalized linear mixed models to tackle the mixture of paired and unpaired plots. Finally we propose a database structure to store analysis results.



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