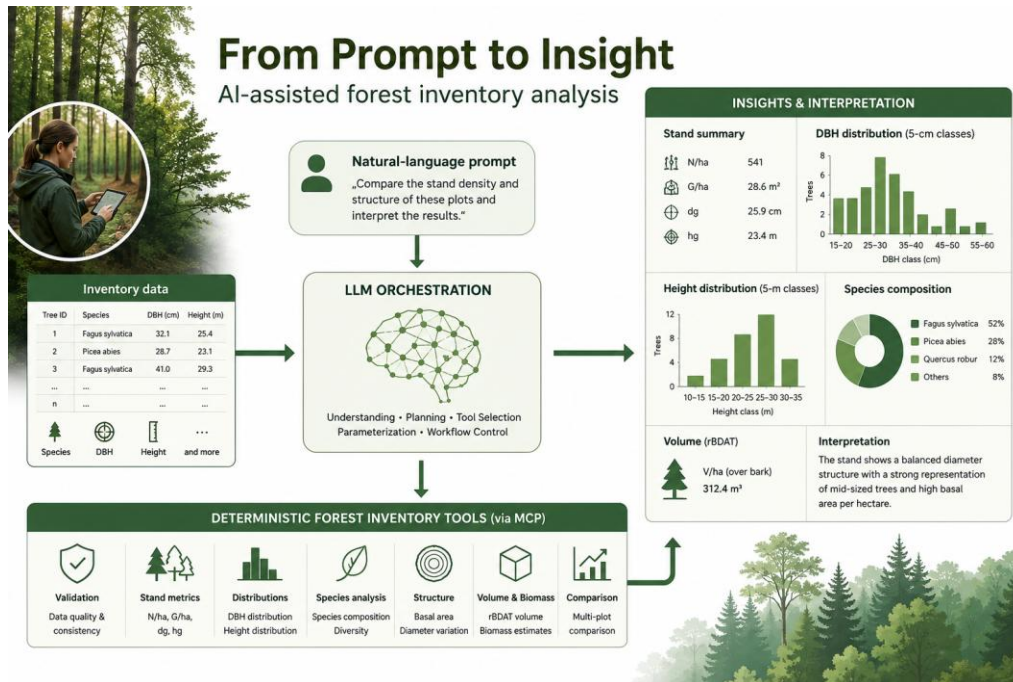


# MASTER THESIS TOPIC

## From Prompts to Reproducible Forest Inventory Analysis: LLM-Orchestrated Forest Inventory Analysis



**Background:** Forest inventory analysis increasingly combines tabular data, established domain methods, statistical workflows and specialist software. Large language models (LLMs) offer a new way to access such analyses through natural language. However, direct LLM-based calculations may be unreliable and difficult to reproduce. A promising alternative is to let an LLM translate user prompts into calls to validated, deterministic analysis tools.

**Objectives:** This thesis will develop and evaluate an AI-assisted system that translates natural-language requests into reproducible forest inventory analyses. Combining forestry expertise with modern data science, the system will use an LLM to select and orchestrate validated Python/R tools for tasks such as data validation, stand metrics, structural analysis, species composition and volume estimation.

**Prerequisites:** Knowledge of forest inventory and basic statistics; willingness to self-study Python; interest in AI/LLMs and reproducible data analysis.

The thesis combines forest inventory, applied AI and reproducible scientific computing. A working prototype of the MCP-based forest inventory tool system is already available as a starting point.

### Contact

Dr. Nils Nölke  
 Abteilung Waldinventur und Fernerkundung  
 nils.noelke@forst.uni-goettingen.de