



Workshop: Regionalization of Forest Stand Variables  
-TCP /IND/3505 -

Lab 00 Introduction and software setup

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# Workshop Objectives

- Demonstration of methods and approaches to link forest inventory and remote sensing data to obtain wall-to-wall maps of forest stand variables
- Showing open source alternatives for image processing and modelling
- By the end of the workshop you should:
  - Have an understanding of the different processing steps required
  - Know how to develop models for predicting stand variables
  - Know how to create prediction maps
  - Have an idea why open source is a relevant alternative for data processing

# Open Source



- *What is open source?*
  - The freedom to run a program for every purpose
  - The freedom to study how the program works
  - The freedom to modify, improve and redistribute copies of the program
- *Why open source for geodata processing?*
  - Data formats and descriptions are open → no proprietary formats!
  - Open formats facilitate the development of standards which increases the compatibility and accessibility of map products -> e.g. OGC
  - Access to the source code allows verification of the processing logic and thus increases the transparency
  - A large community is increasing the pace of innovation and provides excellent support
  - License costs can be reduced



# Open Source Software

## Some facts on R:

- R is a language and environment for statistical computing and graphics
- Freely available and maintained by volunteers
- R is extensible; can be expanded by installing “packages”
- R is the most widely used statistical software globally
- R can handle geospatial data such as vector or raster files



### Main Advantages:

- Its open source
- Fully documented and easy access of the documentation
- Large community -> there are hundreds of websites that can help you learn R
- Statistical methods implemented in the main packages are generally accepted

## Open Source Software



### Some facts on RStudio:

- RStudio is an IDE / user interface to R which allows to run R in a more user-friendly environment
- Desktop version is freely available
- RStudio allows setting up different projects and switching between workspaces
- Integrated version control using GIT
- RStudio can also be used to write L<sup>A</sup>T<sub>E</sub>X documents, program websites and much many more

# Tips and Reminders when working with R

- R is case-sensitive
- When writing file path names you need to use `'/'` instead of `'\'`
  - e.g. `"C:/Users/Paul/workshop"`
- Comment your code so you remember what it does; comments are preceded with `#`
- R scripts are simply text files with a `.R` extension
- Use the Tab key to let R/R Studio finish typing commands for you
- Use Shift + down arrow to mark lines or blocks of code
- In R Studio: Ctrl + 1 and Ctrl + 2 switches between script and console
- Use up and down arrows to cycle through previous commands in console
- Don't be afraid of errors; you won't break R



# LAB 1: Preparing your working environment

- Determine the operation system of your computer.
- Check if R is installed
- Install Rstudio using the file provided in:
  - workshop\software\RStudio-1.0.153.exe
- Start R-Studio familiarize with the GUI
- Create a new project in R-Studio in the folder „workshop“