Decision Support System for marginal lands management - General description

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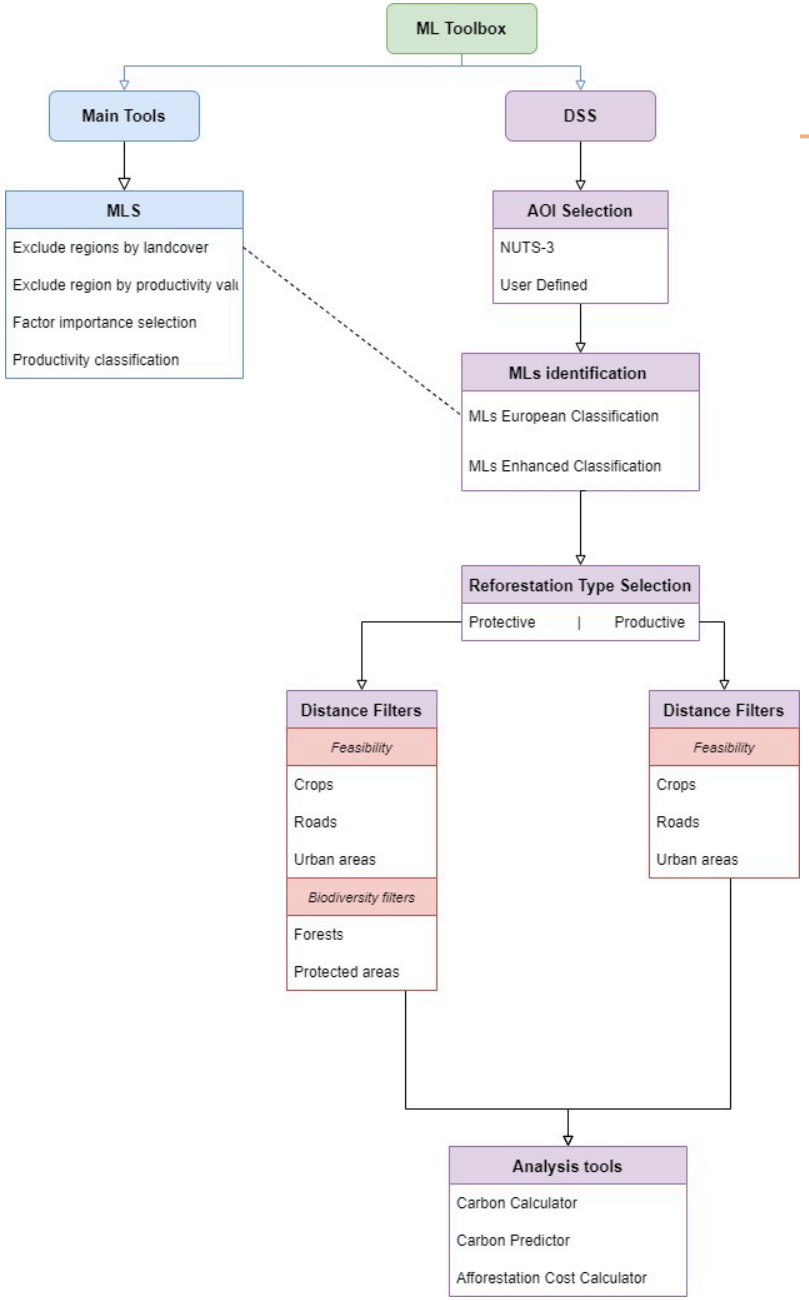
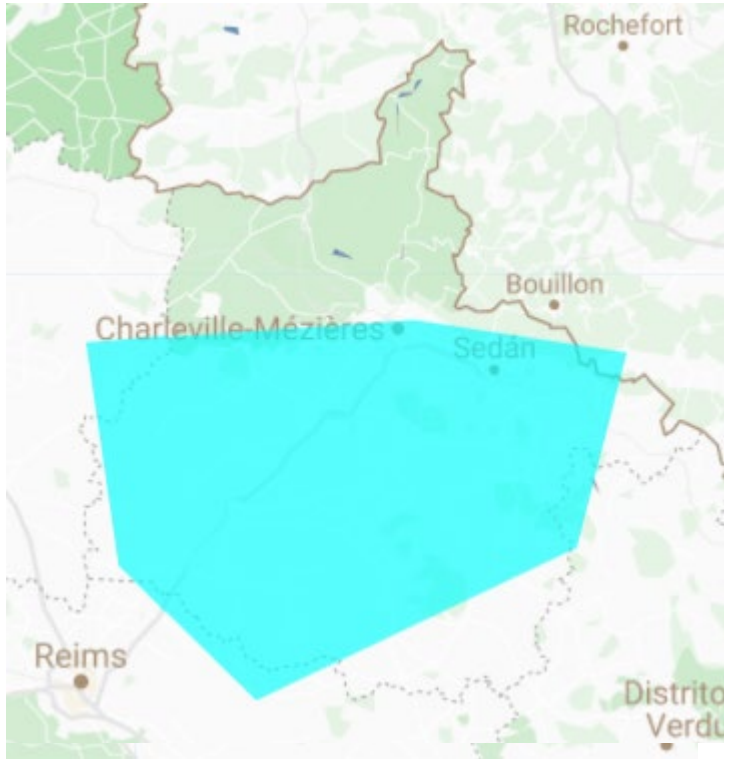
MAIL toolbox: structure

- MAIL toolbox
  - Main tools
    - Exclude regions by land cover
    - Exclude regions by productivity values
    - Factor importance selection
    - Productivity Classification
  - DSS:
    - Area Selection
    - Identification of MLs
    - Distance Filters
    - Analysis tools


ML Toolbox
Main Tools
DSS
MLS
Exclude regions by landcover
Exclude region by productivity valı
Factor importance selection
Productivity classification
AOI Selection
NUTS-3
User Defined
MLs identification
MLs European Classification
MLs Enhanced Classification
Reforestation Type Selection
Protective | Productive
Distance Filters
Feasibility
Crops
Roads
Urban areas
Biodiversity filters
Forests
Protected areas
Distance Filters
Feasibility
Crops
Roads
Urban areas
Analysis tools
Carbon Calculator
Carbon Predictor
Afforestation Cost Calculator

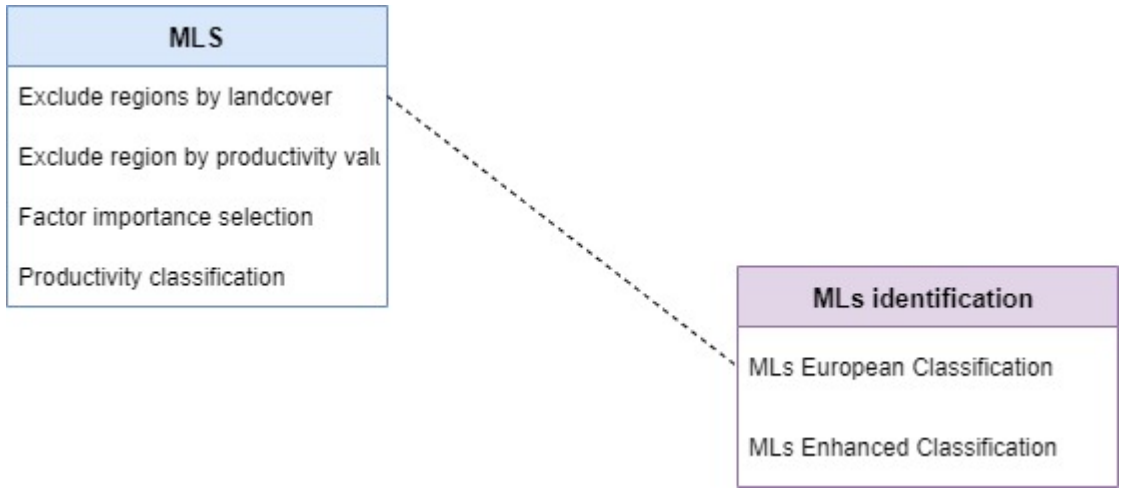
DSS: toolbox

- Define the area of interest:
  - NUTS 3: using GAUL level 2
  - User defined polygon

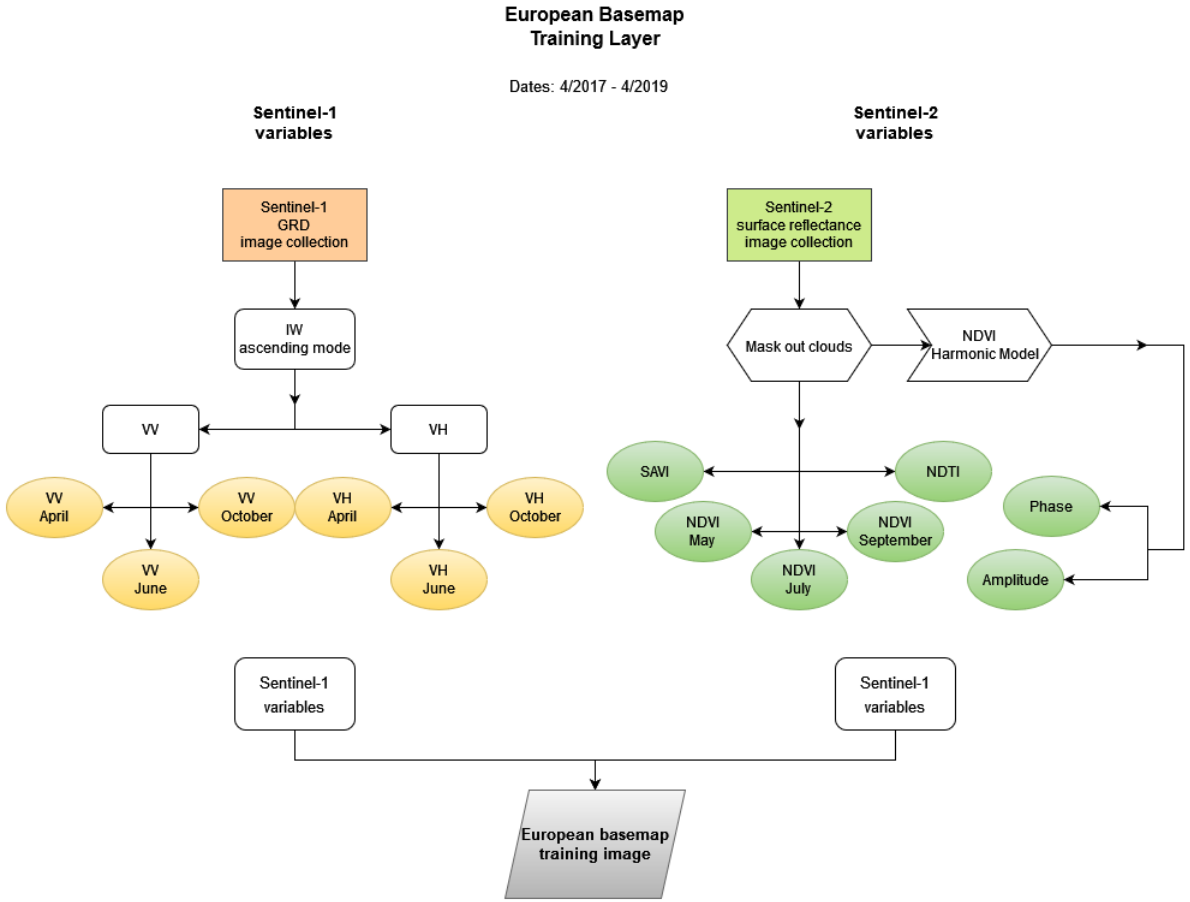


DSS: Identification of MLs

- MLs European Classification
- MLs Enhanced Classification

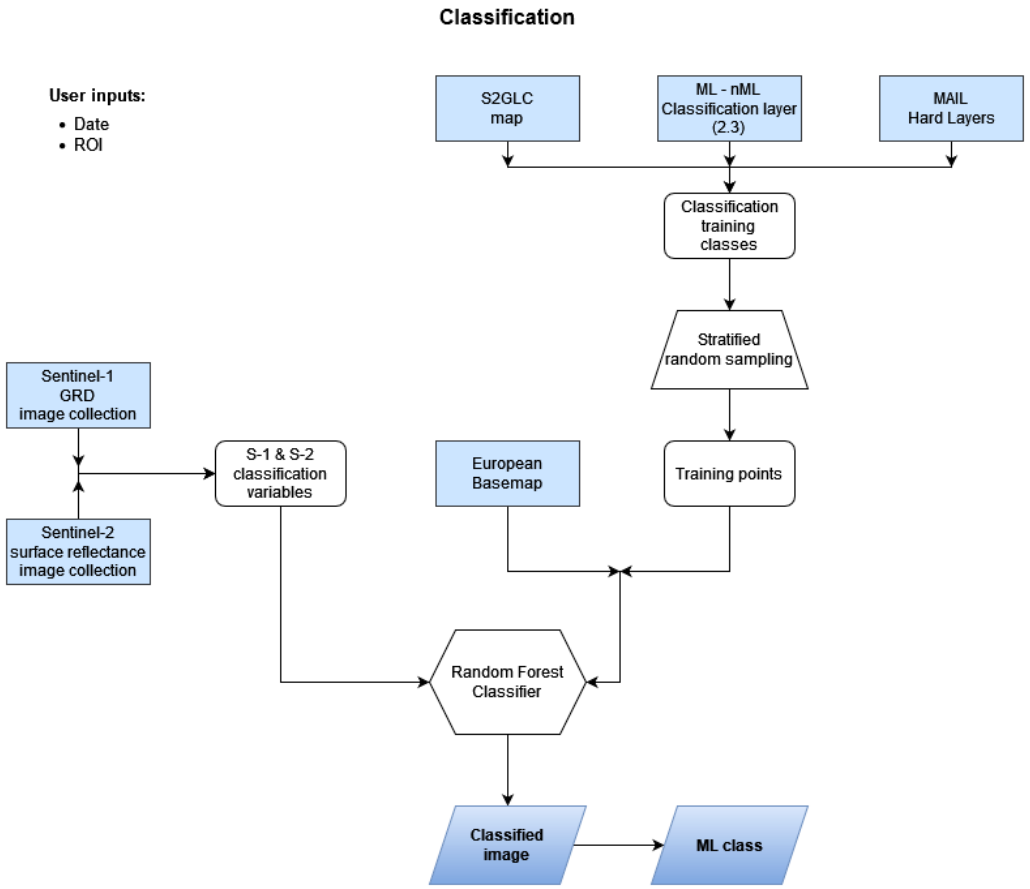


European Basemap Training Layer



Authors: Michał Krupiński and Georgios Spanos

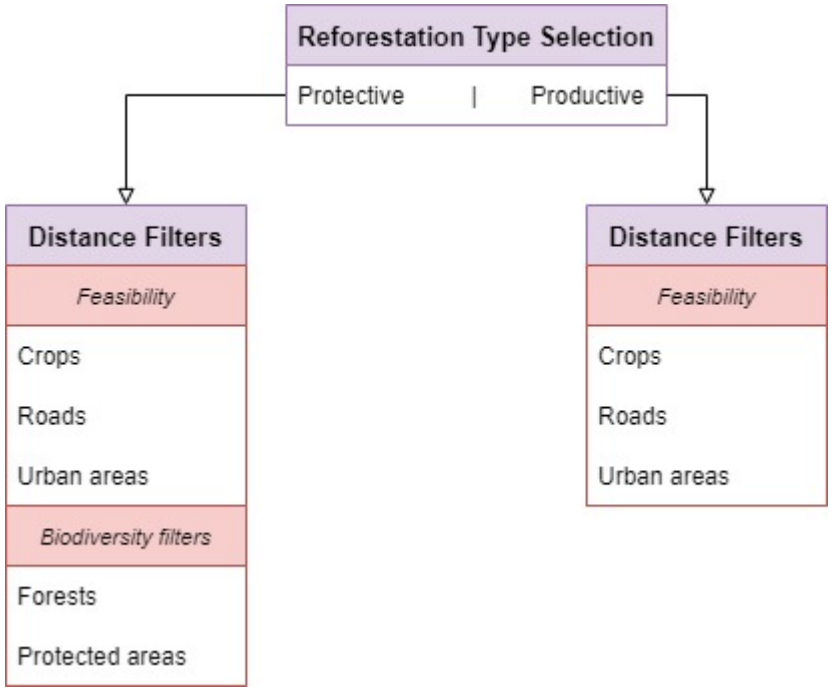
Classification



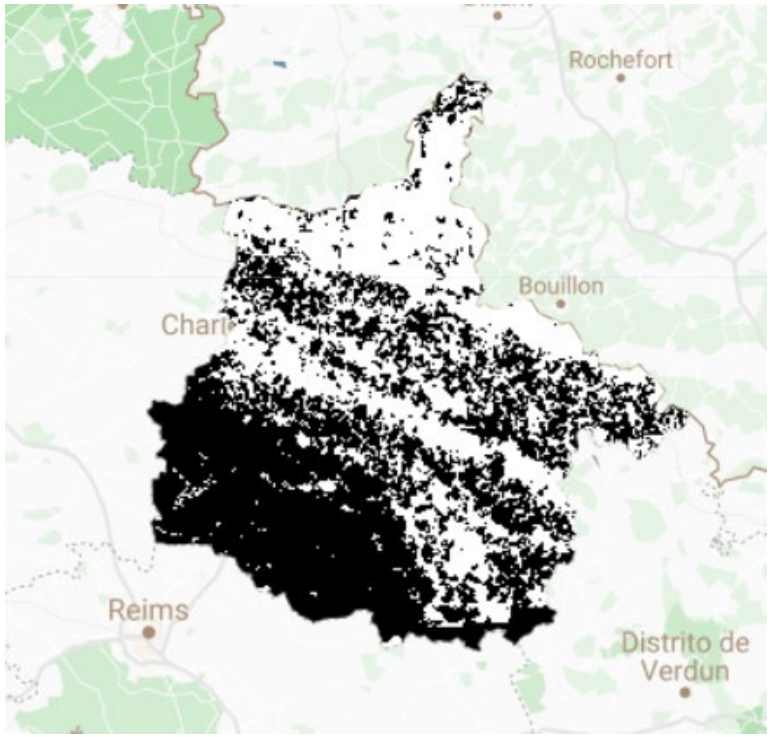
Authors: Michał Krupiński and Georgios Spanos

Distance Filters

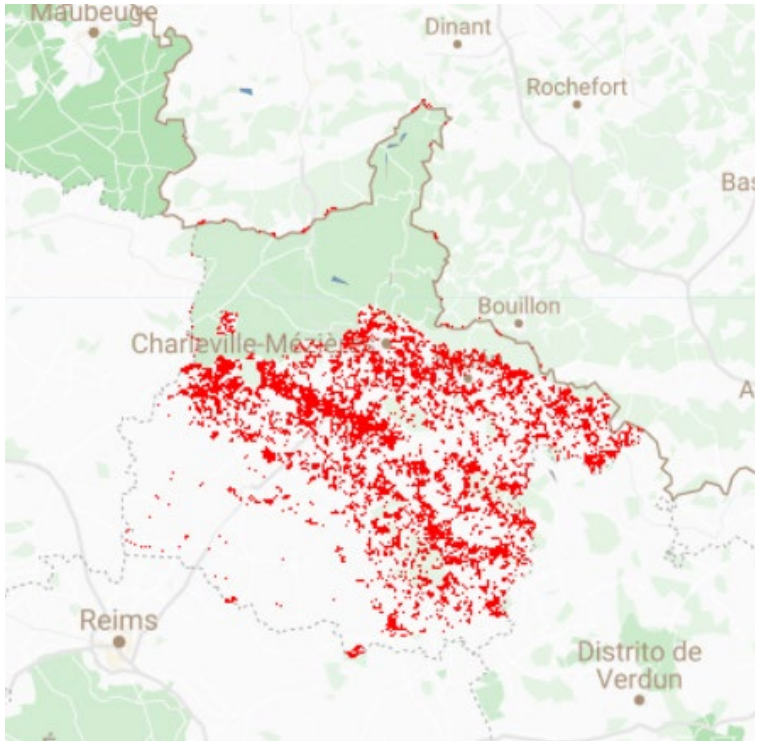
- Two reforestation scenarios
  - Protective :
    - Distance filters applied:
      - Feasibility:
        - Crops
        - Roads
        - Urban Areas
      - Biodiversity:
        - Forests
        - Protected Areas
  - Productive:
    - Distance filters applied:
      - Feasibility:
        - Crops
        - Roads
        - Urban Areas



Distance Filters



Distance Mask



Masked MLs Enhanced Classification

Analysis Tools

- Analysis Tools
  - Carbon Calculator:
    - Calculates carbon for a given DBH for a selection of species using biomass equations. (Forrester et al. 2017)
  - Carbon Predictor:
    - Predicts DBH (Schelhaas et al. 2018)
    - Applies Carbon calculator biomass equations
  - Afforestation Cost Calculator:
    - Retrieves the cost of planting one tree based on: slope, distance from cities, soil texture and labour cost.

Analysis tools
Carbon Calculator
Carbon Predictor
Afforestation Cost Calculator

References

- Analysis Tools

- Forrester, D. I., Tachauer, I. H. H., Annighoefer, P., Barbeito, I., Pretzsch, H., Ruiz-Peinado, R., ... & Sileshi, G. W. (2017). Generalized biomass and leaf area allometric equations for European tree species incorporating stand structure, tree age and climate. Forest Ecology and Management, 396, 160-175.

- Schelhaas, MJ., Hengeveld, G.M., Heidema, N. *et al.* Species-specific, pan-European diameter increment models based on data of 2.3 million trees. *For. Ecosyst.* **5,** 21 (2018). https://doi.org/10.1186/s40663-018-0133-3

Thank you for your attention!

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