SIMANFOR

Model for *Pinus nigra* Cataluña (Spain)

Model

Pnigra Cataluña

Individual tree growth model for *Pinus nigra* in Cataluña (Spain)

Model description

- Species: *Pinus nigra* J.F.Arnold

- Species SFNI (Spanish Forest National Inventory) code: 25

- Geographical area: Cataluña

- Geographical area (administrative): Gerona, Lleida, Barcelona and Tarragona

Model requirements and recommended use

- Initial inventory requirements: age and dominant height of the plot; expan and dbh of the trees. Aspect, slope and altitude are variables needed in order to calculate mushroom variables

- Geographical area: Cataluña, closer places and another places with similar characteristics (assuming differences)

- Stand type: monospecific stands

- Execution recommended time: 5 years executions (survival, growth and ingrowth equations developed by using that criteria)

- Site Index is defined as top height at a base age of 60 years

Figure 1: *Pinus nigra*
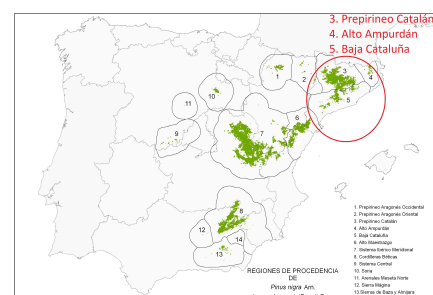

Figure 2: Details of *Pinus nigra*

Figure 3: Provenance regions of *Pinus nigra* in Spain
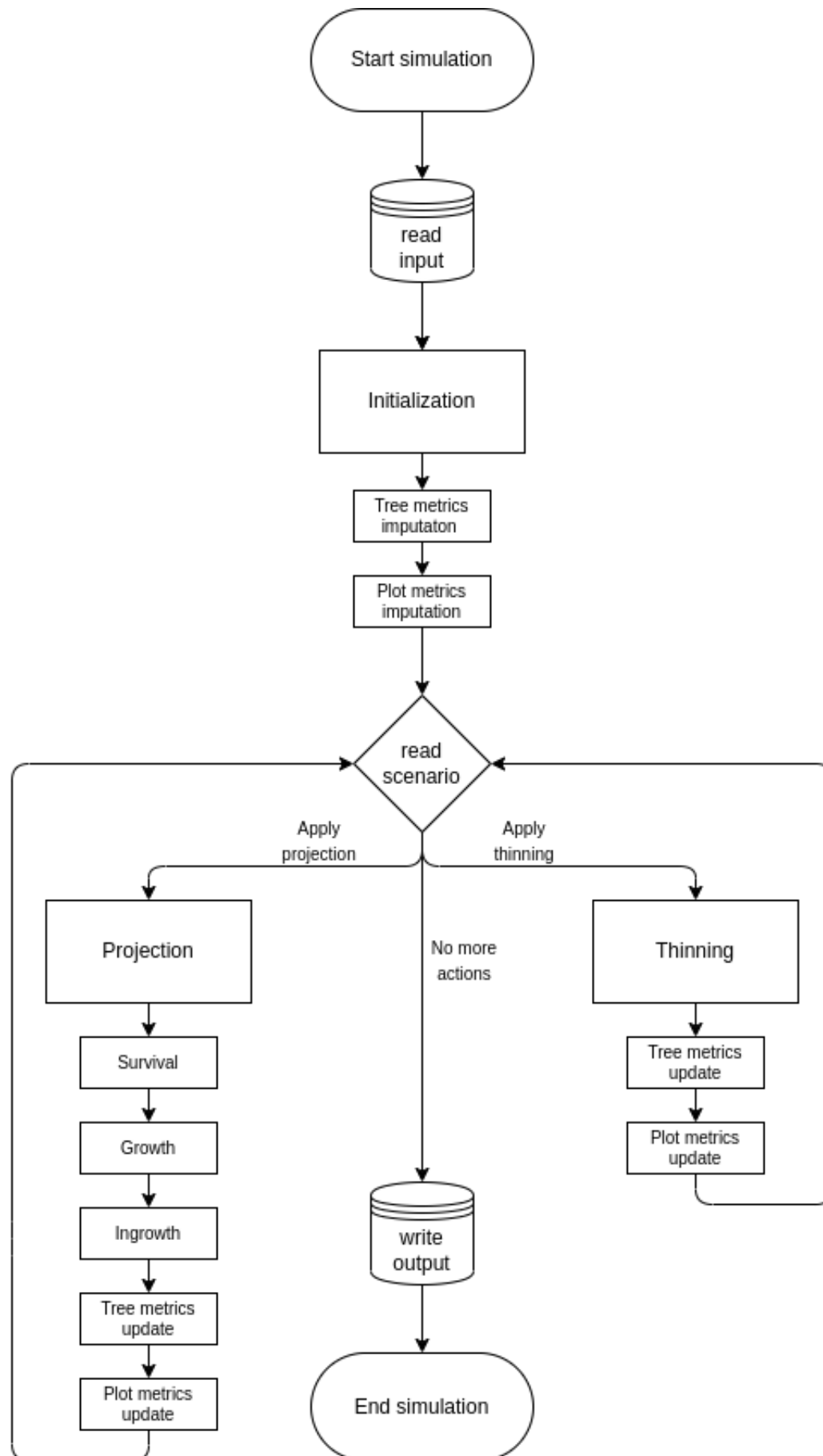
Bibliography

SIMANFOR model recommended citation:

SIMANFOR (year). Individual tree growth model independent from distance for black pine (*Pinus nigra*) in Cataluña (Spain). https://www.simanfor.es/

Model components:

- **Site Index equations**:
  Palahí M, Grau JM (2003). Preliminary site index model and individual-tree growth and mortality models for black pine (Pinus nigra Arn.) in Catalonia (Spain). Forest Systems, 12(1), 137-148

- **Survival equation**:
  Palahí M, Grau JM (2003). Preliminary site index model and individual-tree growth and mortality models for black pine (Pinus nigra Arn.) in Catalonia (Spain). Forest Systems, 12(1), 137-148

- **Diameter growth equation**:
  Palahí M, Grau JM (2003). Preliminary site index model and individual-tree growth and mortality models for black pine (Pinus nigra Arn.) in Catalonia (Spain). Forest Systems, 12(1), 137-148

- **Ingrowth and distribution equation**:
  Trasobares, A., Pukkala, T., Miina, J. (2004). Growth and yield model for uneven-aged mixtures of Pinus sylvestris L. and Pinus nigra Arn. in Catalonia, north-east Spain. Annals of forest science, 61(1), 9-24.

- **General calculations: bal, g, slenderness, normal circumference**:
  Standard equations

- **Generalized height-diameter equation**:
  Palahí M, Grau JM (2003). Preliminary site index model and individual-tree growth and mortality models for black pine (Pinus nigra Arn.) in Catalonia (Spain). Forest Systems, 12(1), 137-148

- **Taper equations over bark (volume)**:
  Rodríguez F, Lizarralde I (2015). Comparison of stem taper equations for eight major tree species in the Spanish Plateau. Forest systems, 24(3), 2

- **Biomass equations**:
  Ruiz-Peinado R, del Rio M, Montero G (2011). New models for estimating the carbon sink capacity of Spanish softwood species. Forest Systems, 20(1), 176-188

- **Technological wood uses information**:
  Rodríguez F (2009). Cuantificación de productos forestales en la planificación forestal: Análisis de casos con cubiFOR. In Congresos Forestales

- **Value for Reineke Index equation**:
  Aguirre A, Condés S, del Río M (2017) Variación de las líneas de máxima densidad de las principales especies de pino a lo largo del gradiente estacional de la Península Ibérica. 7 Congreso Forestal Español

- **Edible and marketed mushrooms equations**:
  Palahí M, Pukkala T, Bonet JA, Colinas C, Fischer CR, Martínez de Aragón JR (2009). Effect of the inclusion of mushroom values on the optimal management of even-aged pine stands of Catalonia. Forest Science, 55(6), 503-511

Figures:

- **Figure 1:** by Myrabella, licensed under CC BY-SA 4.0

- **Figure 2:** by `https://antropocene.it`

- **Figure 3:** extracted from MAPA

```
                    ╭─────────────────╮
                    │ Start simulation │
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                        │  read   │
                        │  input  │
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                    │  Initialization │
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                    │  Tree metrics   │
                    │   imputaton     │
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                    │  Plot metrics   │
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                          ◇ read  ◇
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```

Apply projection   No more actions   Apply thinning

Projection		Thinning
Survival	write output	Tree metrics update
Growth	End simulation	Plot metrics update
Ingrowth		
Tree metrics update		
Plot metrics update		

Contacts

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Related information

SIMANFOR - Support System for the Simulation of Sustainable Forest Management Alternatives. Website (`https://www.simanfor.es/`) and GitHub repository `https://github.com/simanfor`

iuFOR - University Institute for Sustainable Forest Management. Website: `http://sostenible.palencia.uva.es/` y `https://iufor.uva.es/`

ETSIIAA Palencia - Higher Technical School of Agricultural Engineering of Palencia. Website: `http://etsiiaa.uva.es/`

UVa - University of Valladolid. Website `https://www.uva.es`