Model for *Pinus pinaster mesogeensis* stands Mediterranean Iberian Peninsula (Spain)

Model

Ppinaster_m_stand__iberian_peninsula__v01.py

Model description

- Specie: *Pinus pinaster* Ait. subsp. *mesogeensis*
- Spanish Forest Inventory (SFI) code: 26
- Geographical area: Mediterranean Iberian Peninsula

Figure 1: *Pinus pinaster*

Model type

- Category: stand growth
- Model level: stand
- Reproduction methods: seedling forest
- Stand structure: even-aged stands
- Species composition: monospecific stands
- Forest origin: natural

Figure 2: Details of *Pinus pinaster*

Model requirements and recommended use

- Initial inventory requirements: age, dominant height, basal area and density of the plot
- Geographical area: mediterranean iberian peninsula, closer places and another places with similar characteristics (assuming differences)
- Stand type: monospecific stands, resinated or not
- Execution recommended time: 5 years executions (survival and growth equations developed by using that criteria)
- Site Index is defined as top height at a base age of 80 years

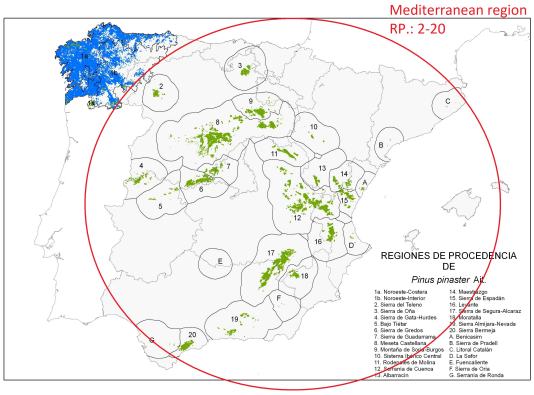


Figure 3: Provenance regions of *Pinus pinaster* in Spain

Bibliography

Complete SIMANFOR model recommended citation):

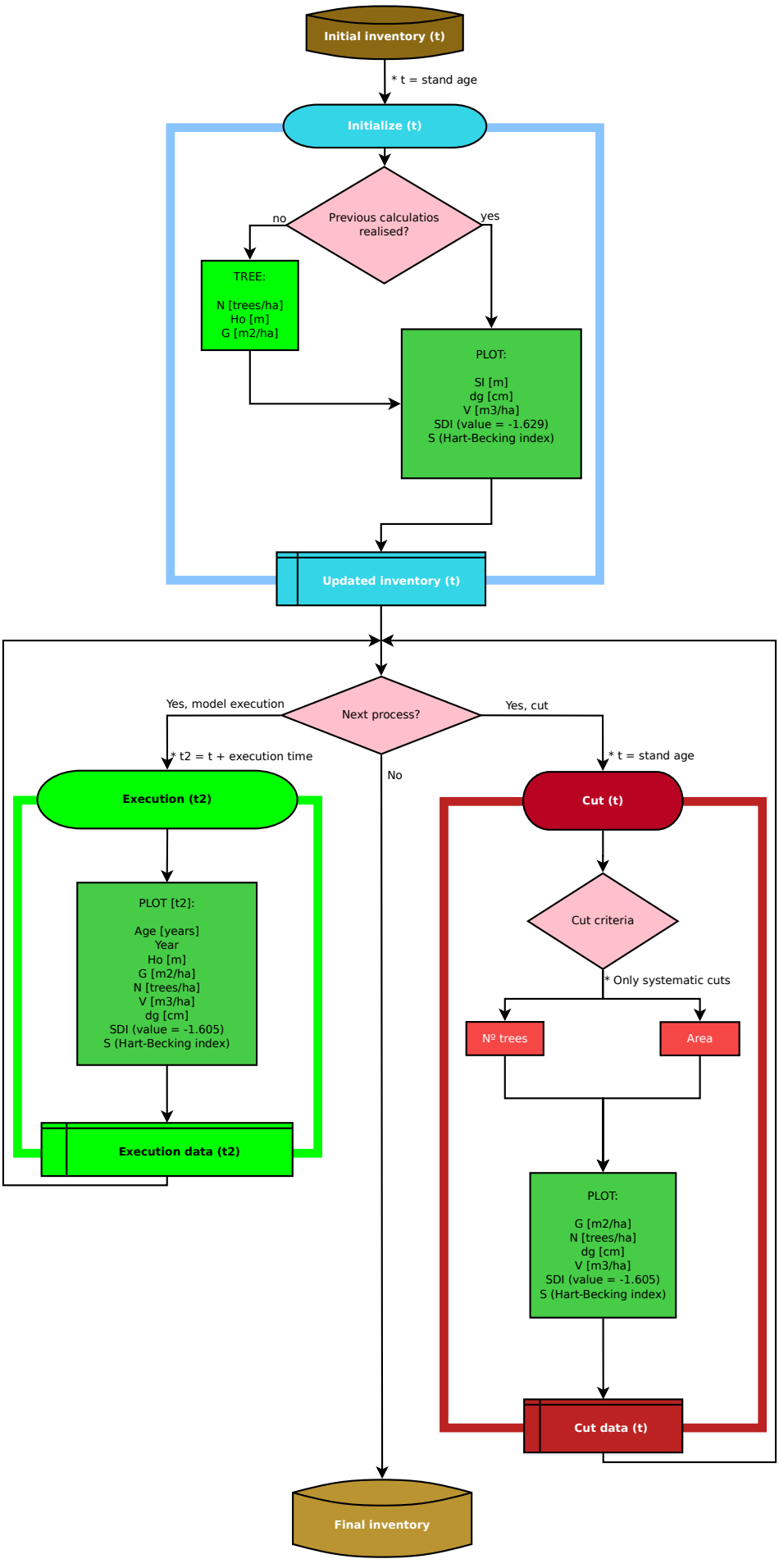
SIMANFOR (2022). Stand growth model for maritime pine (*Pinus pinaster mesogeensis*) in Iberian Peninsula.

Model components:

- **Calculations by using tree data** (just in cases when that information is not available at the initial inventory):
  Density, Basal Area and Dominant Height
- **Site Index equation**:
  Bravo-Oviedo A, del Río M, Montero G (2004). Site index curves and growth model for Mediterranean maritime pine (Pinus pinaster Ait.) in Spain. Forest Ecology and Management, 201(2-3), 187-197
- **Dominant Height Growth equation**:
  Bravo-Oviedo A, del Río M, Montero G (2004). Site index curves and growth model for Mediterranean maritime pine (Pinus pinaster Ait.) in Spain. Forest Ecology and Management, 201(2-3), 187-197
- **Survival equation**:
  Bravo-Oviedo A, del Río M, Montero G (2004). Site index curves and growth model for Mediterranean maritime pine (Pinus pinaster Ait.) in Spain. Forest Ecology and Management, 201(2-3), 187-197
- **Basal Area Growth equation**:
  Bravo-Oviedo A, del Río M, Montero G (2004). Site index curves and growth model for Mediterranean maritime pine (Pinus pinaster Ait.) in Spain. Forest Ecology and Management, 201(2-3), 187-197
- **Initial and Growth Volume equation**:
  Bravo-Oviedo A, del Río M, Montero G (2004). Site index curves and growth model for Mediterranean maritime pine (Pinus pinaster Ait.) in Spain. Forest Ecology and Management, 201(2-3), 187-197
- **Value for Reineke Index equation**:
  del Río M, López E, Montero G (2006). Manual de gestión para masas procedentes de repoblación de Pinus pinaster Ait., Pinus sylvestris L. y Pinus nigra Arn. en Castilla y León (No. 634.9560946 R585). Junta de Castilla y León, Castilla y León (España). Consejería de Medio Ambiente Ministerio de Educación y Ciencia, Madrid (España) Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria, Madrid (España)
- **Quadratic Mean Diameter and Hart Index equation**:
  Standard equations
- **Harvest equations**:
  Harvest equations developed by using equations mentioned before.
  CUTS BY VOLUME NOT AVAILABLE YET.
- **Quadratic Mean Diameter after thinning equation**:
  Bravo-Oviedo A, del Río M, Montero G (2004). Site index curves and growth model for Mediterranean maritime pine (Pinus pinaster Ait.) in Spain. Forest Ecology and Management, 201(2-3), 187-197
- **Fungi production equation**:
  Herrero C, Berraondo I, Bravo F, Pando V, Ordóñez C, Olaizola J, ... Oria de Rueda JA (2019). Predicting mushroom productivity from long-term field-data series in Mediterranean *Pinus pinaster* Ait. forests in the context of climate change. Forests, 10(3), 206

Figures:

- **Figure 1:** by Felipe Castilla, website `http://www.arbolapp.es/especies/ficha/pinus-pinaster/`
- **Figure 2:** by 'A description of the genus *Pinus*', Aylmer Bourke Lambert
- **Figure 3:** extracted from MAPA


Initial inventory (t)
* t = stand age
Initialize (t)
Previous calculatios realised?
no
yes
TREE:
N [trees/ha]
Ho [m]
G [m2/ha]
PLOT:
SI [m]
dg [cm]
V [m3/ha]
SDI (value = -1.629)
S (Hart-Becking index)
Updated inventory (t)
Next process?
Yes, model execution
Yes, cut
No
* t2 = t + execution time
* t = stand age
Execution (t2)
PLOT [t2]:
Age [years]
Year
Ho [m]
G [m2/ha]
N [trees/ha]
V [m3/ha]
dg [cm]
SDI (value = -1.605)
S (Hart-Becking index)
Execution data (t2)
Cut (t)
Cut criteria
* Only systematic cuts
Nº trees
Area
PLOT:
G [m2/ha]
N [trees/ha]
dg [cm]
V [m3/ha]
SDI (value = -1.605)
S (Hart-Becking index)
Cut data (t)
Final inventory

Contacts

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Interest Links

SIMANFOR - Support system for simulating Sustainable Forest Management Alternatives. Accessed 11 May 2021, in `https://www.simanfor.es/`

iuFOR - Sustainable Forest Management Research Institute UVa-INIA. Accessed 11 May 2021, in `http://sostenible.palencia.uva.es/`

ETSIIAA Palencia - Higher Technical School of Agricultural Engineering of Palencia. Accessed 11 May 2021, in `http://etsiiaa.uva.es/`

UVa - University of Valladolid. Accessed 11 May 2021, in `https://www.uva.es`