Model for *Betula pubescens* stands Galicia (Spain)

Model

Bpubescens_stand__gal__v01.py

Model description

- Specie: *Betula pubescens* Ehrh.
- Spanish Forest Inventory (SFI) code: 273
- Geographical area: Galicia
- Geographical area (administrative): A Coruña, Lugo, Pontevedra and Ourense

Figure 1: *Betula pubescens*

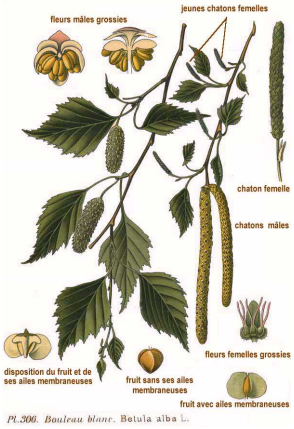


Figure 2: Details of *Betula pubescens*

Model type

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

Model requirements and recommended use

- Initial inventory requirements: age, mean height and density of the plot
- Geographical area: Galicia, closer places and another places with similar characteristics (assuming differences)
- Stand type: monospecific stands
- Execution recommended time: 1 year executions (survival, growth and ingrowth equations developed by using that criteria)
- Site Index is defined as top height at a base age of 20 years

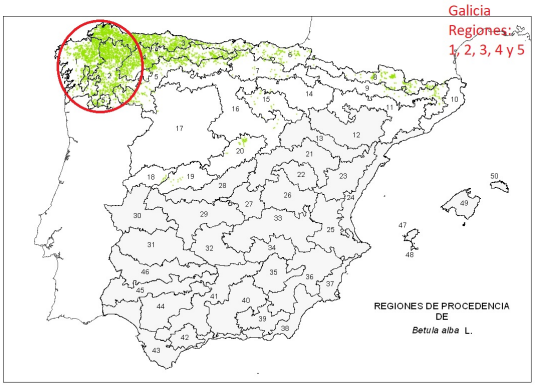


Figure 3: Provenance regions of *Betula pubescens* in Spain

Bibliography

Complete SIMANFOR model recommended citation):

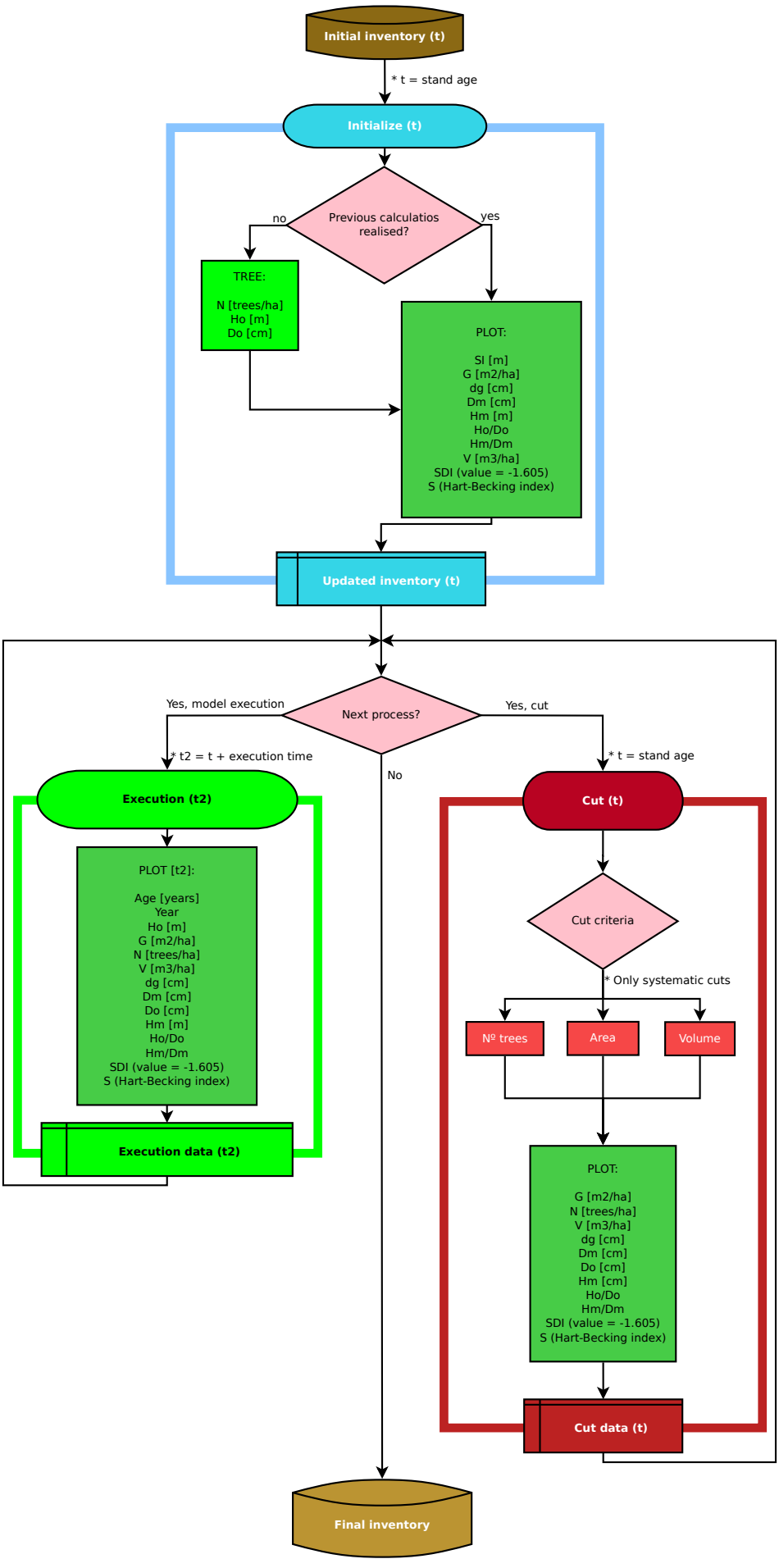
SIMANFOR (2022). Stand growth model for white birch (*Betula pubescens*) in Galicia (Spain).

Model components:

- **Calculations by using tree data** (just in cases when that information is not available at the initial inventory):
  Density and Dominant Height
- **Site Index equation**:
  Diéguez-Aranda U, Rojo A, Castedo-Dorado F, et al (2009). Herramientas selvícolas para la gestión forestal sostenible en Galicia. Forestry, 82, 1-16
  Gómez-García E, Crecente-Campo F, Stankova T, Rojo A, Diéguez-Aranda U (2010). Dynamic growth model for Birch stands in northwestern Spain. FORESTRY, 16(2), 40
- **Dominant Height Growth equation**:
  Diéguez-Aranda U, Rojo A, Castedo-Dorado F, et al (2009). Herramientas selvícolas para la gestión forestal sostenible en Galicia. Forestry, 82, 1-16
  Gómez-García E, Crecente-Campo F, Stankova T, Rojo A, Diéguez-Aranda U (2010). Dynamic growth model for Birch stands in northwestern Spain. FORESTRY, 16(2), 40
- **Survival equation**:
  Gómez-García E, Crecente-Campo F, Stankova T, Rojo A, Diéguez-Aranda U (2010). Dynamic growth model for Birch stands in northwestern Spain. FORESTRY, 16(2), 40
- **Initial and Growth Basal Area equation**:
  Gómez-García E, Crecente-Campo F, Stankova T, Rojo A, Diéguez-Aranda U (2010). Dynamic growth model for Birch stands in northwestern Spain. FORESTRY, 16(2), 40
- **Volume equation**:
  Diéguez-Aranda U, Rojo A, Castedo-Dorado F, et al (2009). Herramientas selvícolas para la gestión forestal sostenible en Galicia. Forestry, 82, 1-16
- **Mean Height and Diameter equation**:
  Gómez-García E, Crecente-Campo F, Stankova T, Rojo A, Diéguez-Aranda U (2010). Dynamic growth model for Birch stands in northwestern Spain. FORESTRY, 16(2), 40
- **Quadratic Mean Diameter equation**:
  Diéguez-Aranda U, Rojo A, Castedo-Dorado F, et al (2009). Herramientas selvícolas para la gestión forestal sostenible en Galicia. Forestry, 82, 1-16
- **Hart and Reineke Index equations**:
  Standard equations
- **Harvest equations**:
  Harvest equations developed by using equations mentioned before.

Figures:

- **Figure 1:** by Felipe Castilla, website `http://www.arbolapp.es/especies/ficha/betula-pubescens/`
- **Figure 2:** by De Amédée Masclef - Atlas des plantes de France. 1891, Public domain, `https://commons.wikimedia.org/w/index.php?curid=5767285`
- **Figure 3:** extracted from MAPA


Initial inventory (t)
* t = stand age
Initialize (t)
Previous calculatios realised?
no
yes
TREE:
N [trees/ha]
Ho [m]
Do [cm]
PLOT:
SI [m]
G [m2/ha]
dg [cm]
Dm [cm]
Hm [m]
Ho/Do
Hm/Dm
V [m3/ha]
SDI (value = -1.605)
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]
Dm [cm]
Do [cm]
Hm [m]
Ho/Do
Hm/Dm
SDI (value = -1.605)
S (Hart-Becking index)
Execution data (t2)
Cut (t)
Cut criteria
* Only systematic cuts
Nº trees
Area
Volume
PLOT:
G [m2/ha]
N [trees/ha]
V [m3/ha]
dg [cm]
Dm [cm]
Do [cm]
Hm [cm]
Ho/Do
Hm/Dm
SDI (value = -1.605)
S (Hart-Becking index)
Cut data (t)
Final inventory

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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`