SIMANFOR

Model for *Pinus radiata* Galicia (Spain)

Model

Pradiata__gal__v01

Model description

- Specie: *Pinus radiata* D. Don
- Spanish Forest Inventory (SFI) code: 28
- Geographical area: Galicia
- Geographical area (administrative): A Coruña, Lugo, Pontevedra and Ourense

Figure 1: *Pinus radiata*

Model type

- Category: growth
- Model level: distance independent individual tree model
- Reproduction methods: seedling forest
- Stand structure: even-aged stands
- Species composition: monospecific stands
- Forest origin: plantation

Figure 2: Details of *Pinus radiata*

Model requirements and recommended use

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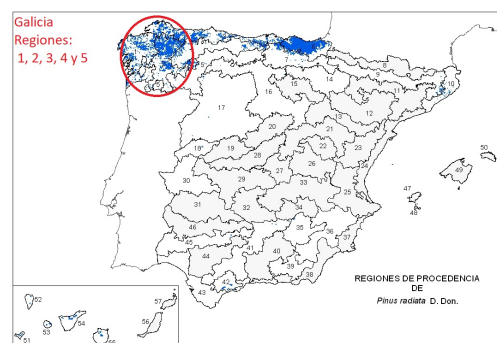- Site Index is defined as top height at a base age of 20 years

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

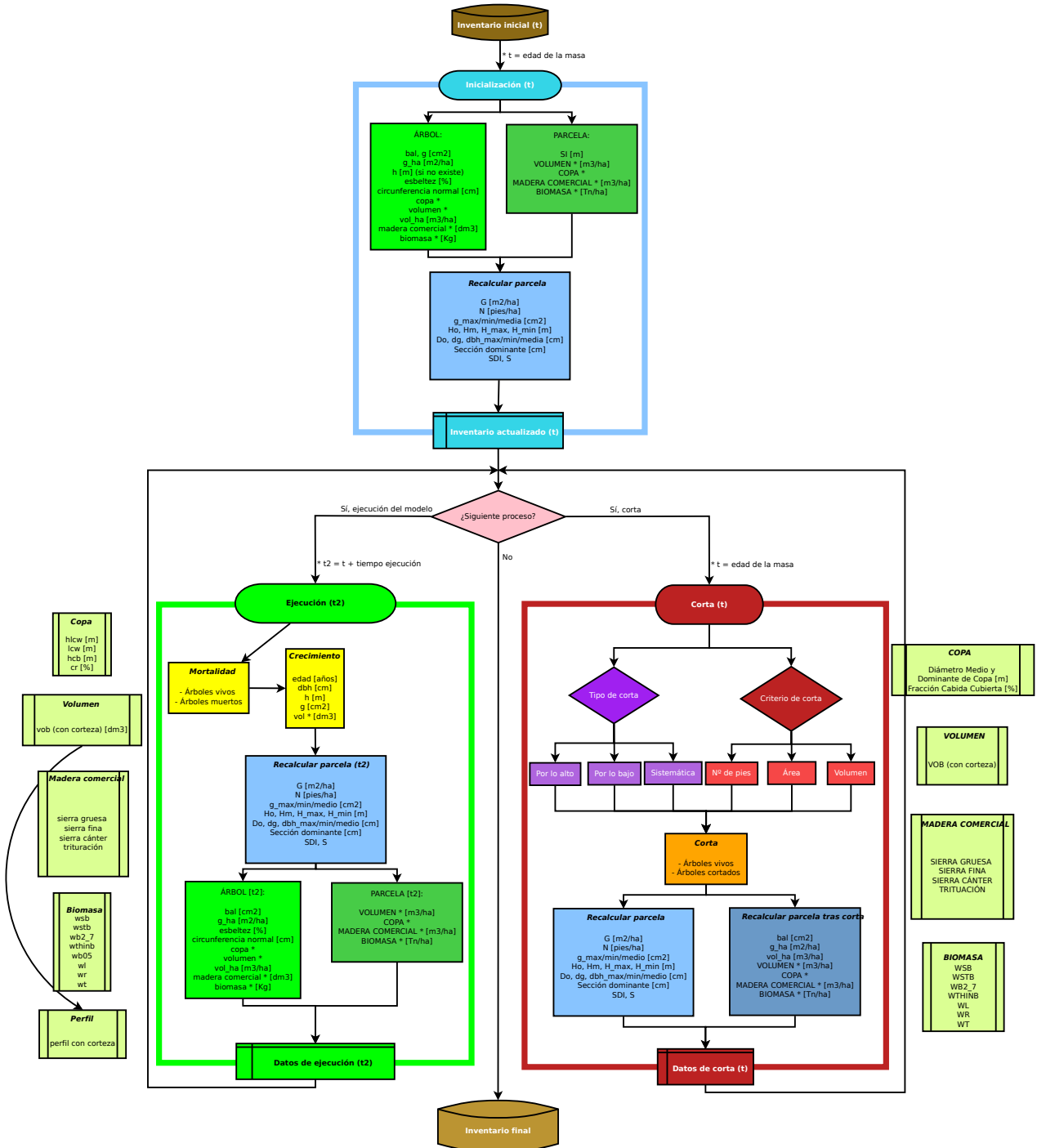# Bibliography

Complete SIMANFOR model recommended citation):

SIMANFOR (2022). Individual tree growth model independent from distance for radiata pine (*Pinus radiata*) in Galicia (Spain).

Model components:

- **Site Index equations**:
  Diéguez-Aranda U, Burkhart HE, Rodríguez-Soalleiro R (2005). Modeling dominant height growth of radiata pine (Pinus radiata D. Don) plantations in north-western Spain. Forest Ecology and Management, 215(1-3), 271-284

- **Survival equation**:
  Crecente-Campo F (2008). Modelo de crecimiento de árbol individual para Pinus radiata D. Don en Galicia. Univ Santiago de Compostela

- **Diameter growth equation**:
  Crecente-Campo F (2008). Modelo de crecimiento de árbol individual para Pinus radiata D. Don en Galicia. Univ Santiago de Compostela

- **Height growth equation**:
  Crecente-Campo F (2008). Modelo de crecimiento de árbol individual para Pinus radiata D. Don en Galicia. Univ Santiago de Compostela

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

- **Generalized height-diameter equation**:
  Dorado FC, Diéguez-Aranda U, Anta MB, Rodríguez MS, von Gadow K (2006). A generalized height–diameter model including random components for radiata pine plantations in northwestern Spain. Forest Ecology and Management, 229(1-3), 202-213

- **Crown equations**:
  Crecente-Campo F (2008). Modelo de crecimiento de árbol individual para Pinus radiata D. Don en Galicia. Univ Santiago de Compostela

- **Taper equations over bark (volume)**:
  Diéguez-Aranda U, Rojo A, Castedo-Dorado F, et al (2009). Herramientas selvícolas para la gestión forestal sostenible en Galicia. Forestry, 82, 1-16

- **Biomass equations**:
  Diéguez-Aranda U, Rojo A, Castedo-Dorado F, et al (2009). Herramientas selvícolas para la gestión forestal sostenible en Galicia. Forestry, 82, 1-16

- **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**:
  Standard

Figures:

- **Figure 1:** licensed under CC BY 2.0, https://commons.wikimedia.org/w/index.php?curid=550387

- **Figure 2:** by 'Manual de selvicultura del Pino Radiata en Galicia', website: http://www.agrobyte.com/publicaciones/pinoradiata/cap1.html

- **Figure 3:** extracted from MAPA

Inventario inicial (t)

* t = edad de la masa

Inicialización (t)

ÁRBOL:
bal, g [cm2]
g_ha [m2/ha]
h [m] (si no existe)
esbeltez [%]
circunferencia normal [cm]
copa *
volumen *
vol_ha [m3/ha]
madera comercial * [dm3]
biomasa * [Kg]

PARCELA:
SI [m]
VOLUMEN * [m3/ha]
COPA *
MADERA COMERCIAL * [m3/ha]
BIOMASA * [Tn/ha]

Recalcular parcela
G [m2/ha]
N [pies/ha]
g_max/min/media [cm2]
Ho, Hm, H_max, H_min [m]
Do, dg, dbh_max/min/media [cm]
Sección dominante [cm]
SDI, S

Inventario actualizado (t)

¿Siguiente proceso?

Sí, ejecución del modelo — Sí, corta — No

* t2 = t + tiempo ejecución

Ejecución (t2)

* t = edad de la masa

Corta (t)

Copa
hlcw [m]
lcw [m]
hcb [m]
cr [%]

Volumen
vob (con corteza) [dm3]

Madera comercial
sierra gruesa
sierra fina
sierra cánter
trituración

Biomasa
wsb
wstb
wb2_7
wthinb
wb05
wl
wr
wt

Perfil
perfil con corteza

Mortalidad
- Árboles vivos
- Árboles muertos

Crecimiento
edad [años]
dbh [cm]
h [m]
g [cm2]
vol * [dm3]

Recalcular parcela (t2)
G [m2/ha]
N [pies/ha]
g_max/min/medio [cm2]
Ho, Hm, H_max, H_min [m]
Do, dg, dbh_max/min/medio [cm]
Sección dominante [cm]
SDI, S

ÁRBOL [t2]:
bal [cm2]
g_ha [m2/ha]
esbeltez [%]
circunferencia normal [cm]
copa *
volumen *
vol_ha [m3/ha]
madera comercial * [dm3]
biomasa * [Kg]

PARCELA [t2]:
VOLUMEN * [m3/ha]
COPA *
MADERA COMERCIAL * [m3/ha]
BIOMASA * [Tn/ha]

Datos de ejecución (t2)

Tipo de corta

Criterio de corta

Por lo alto — Por lo bajo — Sistemática — Nº de pies — Área — Volumen

COPA
Diámetro Medio y
Dominante de Copa [m]
Fracción Cabida Cubierta [%]

VOLUMEN
VOB (con corteza)

MADERA COMERCIAL
SIERRA GRUESA
SIERRA FINA
SIERRA CÁNTER
TRITUACIÓN

BIOMASA
WSB
WSTB
WB2_7
WTHINB
WL
WR
WT

Corta
- Árboles vivos
- Árboles cortados

Recalcular parcela
G [m2/ha]
N [pies/ha]
g_max/min/medio [cm2]
Ho, Hm, H_max, H_min [m]
Do, dg, dbh_max/min/medio [cm]
Sección dominante [cm]
SDI, S

Recalcular parcela tras corta
bal [cm2]
g_ha [m2/ha]
vol_ha [m3/ha]
VOLUMEN * [m3/ha]
COPA *
MADERA COMERCIAL * [m3/ha]
BIOMASA * [Tn/ha]

Datos de corta (t)

Inventario final

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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`