

Hist:

Afforestation = GRAPH(TIME)

(2012.000, 7800.0), (2013.000, 6700.0), (2014.000, 11500.0), (2015.000, 5600.0), (2016.000, 1400.0), (2017.000, 1400.36), (2018.000, 0.0)

UNITS: Hectares/Year

DOCUMENT: Definition:

Change in forested land area in Romania within one year. The value aggregates changes from human intervention (deforestation/afforestation), as well as changes from natural sources (primarily forest spread). Does not include the regeneration of felled forest land.

Source:

National Institute of Statistics.2019. Silviculture dataset. <http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table>, accessed on 07.02.2019.

Average_afforestation = 5523.15

UNITS: Hectares/Year

DOCUMENT: Definition:

Average change in forested land area in Romania within one year. The value aggregates changes from human intervention (deforestation/afforestation), as well as changes from natural sources (primarily forest spread). The average has been calculated based on yearly values from 1990 onward. Does not include the regeneration of felled forest land.

Source: National Institute of Statistics.2019. Silviculture dataset. <http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table>, accessed on 07.02.2019.

Average_density_of_forest_age_100 = 478.673379152663

UNITS: Cubic Meter/Hectare

DOCUMENT: Definition:

The volume of wood to be found on average in a hectare of forest that is 100 years old. Estimated based on data from the National Forest Inventory. Applicable for 2012. Calculations can be found in Appendix C.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

Average_density_of_forest_age_120 = 502.252656368661

UNITS: Cubic Meter/Hectare

DOCUMENT: Definition:

The volume of wood to be found on average in a hectare of forest that is 120 years old. Estimated based on data from the National Forest Inventory. Applicable for 2012. Calculations can be found in Appendix C.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

Average_density_of_forest_age_140 = 522.322293771339

UNITS: Cubic Meter/Hectare

DOCUMENT: Definition:

The volume of wood to be found on average in a hectare of forest that is 140 years old. Estimated based on data from the National Forest Inventory. Applicable for 2012. Calculations can be found in Appendix C.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

Average_density_of_forest_age_160 = 541.656037499758

UNITS: Cubic Meter/Hectare

DOCUMENT: Definition:

The volume of wood to be found on average in a hectare of forest that is 160 years old. Estimated based on data from the National Forest Inventory. Applicable for 2012. Calculations can be found in Appendix C.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

Average_density_of_forest_age_180 = 560.4450221

UNITS: Cubic Meter/Hectare

DOCUMENT: Definition:

The volume of wood to be found on average in a hectare of forest that is 180 years old. Estimated based on data from the National Forest Inventory. Applicable for 2012. Calculations can be found in Appendix C.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

Average_density_of_forest_age_20 = 128.903324784757

UNITS: Cubic Meter/Hectare

DOCUMENT: Definition:

The volume of wood to be found on average in a hectare of forest that is 20 years old. Estimated based on data from the National Forest Inventory. Applicable for 2012. Calculations can be found in Appendix C.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

Average_density_of_forest_age_40 = 266.656865126831

UNITS: Cubic Meter/Hectare

DOCUMENT: Definition:

The volume of wood to be found on average in a hectare of forest that is 40 years old. Estimated based on data from the National Forest Inventory. Applicable for 2012. Calculations can be found in Appendix C.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

Average_density_of_forest_age_60 = 345.204401909213

UNITS: Cubic Meter/Hectare

DOCUMENT: Definition:

The volume of wood to be found on average in a hectare of forest that is 60 years old. Estimated based on data from the National Forest Inventory. Applicable for 2012. Calculations can be found in Appendix C.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

Average_density_of_forest_age_80 = 421.424921960011

UNITS: Cubic Meter/Hectare

DOCUMENT: Definition:

The volume of wood to be found on average in a hectare of forest that is 80 years old. Estimated based on data from the National Forest Inventory. Applicable for 2012. Calculations can be found in Appendix C.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

"Cvasi-virgin_forest_area" = GRAPH(TIME)

(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 0.0), (2006.00, 0.0), (2007.00, 0.0), (2008.00, 0.0), (2009.00, 0.0), (2010.00, 0.0), (2011.00, 0.0), (2012.00, 110572.453), (2013.00, 0.0), (2014.00, 0.0), (2015.00, 0.0), (2016.00, 0.0), (2017.00, 0.0), (2018.00, 54610.604)

UNITS: Hectares

"Density_of_forest_age_1-20" = GRAPH(TIME)

(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 0.0), (2006.00, 0.0), (2007.00, 0.0), (2008.00, 0.0), (2009.00, 0.0), (2010.00, 0.0), (2011.00, 0.0), (2012.00, 63.06987066), (2013.00, 62.971661), (2014.00, 62.87345134), (2015.00, 62.77524168), (2016.00, 62.67703201), (2017.00, 62.57882235), (2018.00, 62.48061269)

UNITS: Cubic Meters/Hectare

DOCUMENT: Definition:

Volume of wood to be found in one hectare of forest belonging to the age group 1-20.

Source:

NFI. (2012). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Density_of_forest_age_101-120" = GRAPH(TIME)

(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 0.0), (2006.00, 0.0), (2007.00, 0.0), (2008.00, 0.0), (2009.00, 0.0), (2010.00, 0.0), (2011.00, 0.0), (2012.00, 491.1072698), (2013.00, 491.5907868), (2014.00, 492.0743038), (2015.00, 492.5578208), (2016.00, 493.0413379), (2017.00, 493.5248549), (2018.00, 494.0083719)

UNITS: Cubic Meters/Hectare

DOCUMENT: Definition:

Volume of wood to be found in one hectare of forest belonging to the age group 101-120.

Source:

NFI. (2012). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”.
<http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”.
<http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Density_of_forest_age_121-140" = GRAPH(TIME)

(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 0.0), (2006.00, 0.0), (2007.00, 0.0), (2008.00, 0.0), (2009.00, 0.0), (2010.00, 0.0), (2011.00, 0.0), (2012.00, 515.0322892), (2013.00, 516.7925521), (2014.00, 518.552815), (2015.00, 520.3130778), (2016.00, 522.0733407), (2017.00, 523.8336036), (2018.00, 525.5938665)

UNITS: Cubic Meters/Hectare

DOCUMENT: Definition:

Volume of wood to be found in one hectare of forest belonging to the age group 121-140.

Source:

NFI. (2012). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”.
<http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”.
<http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Density_of_forest_age_141-160" = GRAPH(TIME)

(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 0.0), (2006.00, 0.0), (2007.00, 0.0), (2008.00, 0.0), (2009.00, 0.0), (2010.00, 0.0), (2011.00, 0.0), (2012.00, 531.2393749), (2013.00, 535.2711275), (2014.00, 539.30288), (2015.00, 543.3346326), (2016.00, 547.3663851), (2017.00, 551.3981377), (2018.00, 555.4298902)

UNITS: Cubic Meters/Hectare

DOCUMENT: Definition:

Volume of wood to be found in one hectare of forest belonging to the age group 141-160.

Source:

NFI. (2012). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”.
<http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”.
<http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Density_of_forest_age_161-180" = GRAPH(TIME)

(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 0.0), (2006.00, 0.0), (2007.00, 0.0), (2008.00, 0.0), (2009.00, 0.0), (2010.00, 0.0), (2011.00, 0.0), (2012.00, 558.1945391), (2013.00, 554.4498841), (2014.00, 550.7052291), (2015.00, 546.9605741), (2016.00, 543.2159191), (2017.00, 539.4712641), (2018.00, 535.7266091)

UNITS: Cubic Meters/Hectare

DOCUMENT: Definition:

Volume of wood to be found in one hectare of forest belonging to the age group 161-180.

Source:

NFI. (2012). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”.
<http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

Density_of_forest_age_181_and_above = GRAPH(TIME)
(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 0.0), (2006.00, 0.0), (2007.00, 0.0), (2008.00, 0.0), (2009.00, 0.0), (2010.00, 0.0), (2011.00, 0.0), (2012.00, 558.1945391), (2013.00, 554.4498841), (2014.00, 550.7052291), (2015.00, 546.9605741), (2016.00, 543.2159191), (2017.00, 539.4712641), (2018.00, 535.7266091)

UNITS: Cubic Meters/Hectare

DOCUMENT: Definition:

Volume of wood to be found in one hectare of forest belonging to the age group 181 and above.

Source:

NFI. (2012). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Density_of_forest_age_21-40" = GRAPH(TIME)
(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 0.0), (2006.00, 0.0), (2007.00, 0.0), (2008.00, 0.0), (2009.00, 0.0), (2010.00, 0.0), (2011.00, 0.0), (2012.00, 215.5517381), (2013.00, 214.3026919), (2014.00, 213.0536456), (2015.00, 211.8045993), (2016.00, 210.555553), (2017.00, 209.3065068), (2018.00, 208.0574605)

UNITS: Cubic Meters/Hectare

DOCUMENT: Definition:

Volume of wood to be found in one hectare of forest belonging to the age group 21-40.

Source:

NFI. (2012). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Density_of_forest_age_41-60" = GRAPH(TIME)
(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 0.0), (2006.00, 0.0), (2007.00, 0.0), (2008.00, 0.0), (2009.00, 0.0), (2010.00, 0.0), (2011.00, 0.0), (2012.00, 310.4959456), (2013.00, 312.8679706), (2014.00, 315.2399956), (2015.00, 317.6120206), (2016.00, 319.9840456), (2017.00, 322.3560705), (2018.00, 324.7280955)

UNITS: Cubic Meters/Hectare

DOCUMENT: Definition:

Volume of wood to be found in one hectare of forest belonging to the age group 41-60.

Source:

NFI. (2012). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Density_of_forest_age_61-80" = GRAPH(TIME)
(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 0.0), (2006.00, 0.0), (2007.00, 0.0), (2008.00, 0.0), (2009.00, 0.0), (2010.00, 0.0), (2011.00, 0.0), (2012.00,

387.4221084), (2013.00, 387.9925451), (2014.00, 388.5629819), (2015.00, 389.1334186), (2016.00, 389.7038553), (2017.00, 390.274292), (2018.00, 390.8447288)

UNITS: Cubic Meters/Hectare

DOCUMENT: Definition:

Volume of wood to be found in one hectare of forest belonging to the age group 61-80.

Source:

NFI. (2012). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Density_of_forest_age_81-100" = GRAPH(TIME)

(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 0.0), (2006.00, 0.0), (2007.00, 0.0), (2008.00, 0.0), (2009.00, 0.0), (2010.00, 0.0), (2011.00, 0.0), (2012.00, 458.9849059), (2013.00, 460.6955794), (2014.00, 462.4062529), (2015.00, 464.1169265), (2016.00, 465.8276), (2017.00, 467.5382735), (2018.00, 469.2489471)

UNITS: Cubic Meters/Hectare

DOCUMENT: Definition:

Volume of wood to be found in one hectare of forest belonging to the age group 81-100.

Source:

NFI. (2012). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Forest_area_age_1-20_A" = GRAPH(TIME)

(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 1433590.0), (2006.00, 1337791.984), (2007.00, 1241328.917), (2008.00, 1134700.729), (2009.00, 1033346.856), (2010.00, 930363.2116), (2011.00, 825618.459), (2012.00, 720126.4), (2013.00, 703130.8455), (2014.00, 685973.4537), (2015.00, 669280.5664), (2016.00, 651922.6601), (2017.00, 634117.6176), (2018.00, 616304.7531)

UNITS: Hectares

DOCUMENT: Sources:

Year 2005: The National Institute of Statistics, Romanian Government (2006), and FAO (2010), indicate a total forest land area in the National Forest Fund of 6233000 hectares.

Romanian Government (2006), indicates that 23% of this land was aged 1-20 in 2005, which results in an area of 1431313 hectares.

Year 2012: The National Institute of Statistics and Romanian Government (2013) indicate a total forest land area in the National Forest Fund of 6364900 hectares.

Romanian Government (2013) indicates that 11.3% of this land was aged 1-20 in 2012, which results in an area of 720126.4 hectares.

However, Romanian Government (2013) indicates National Forest Inventory (INCDS, 2012) as a source, whereas the National Forest Inventory shows very different data. It is yet unclear why the

numbers differ. Until I receive answers to my queries, I must make two different reference modes, with two different assumptions regarding distributions.

Year 2018: The only available data is from the National Forest Inventory (INCDS, 2018). However, they use the international definition of the term forest, not the national one. A few assumptions therefore had to be made:

Assumption 1: The total forest land area is equal to [Year 2017 value]/[Year 2016 value]*[Year 2017 value] (linear extrapolation).

Thus we obtain 6405800

Assumption 2: The distribution of forest age groups, according to the national definition of forest land, changed proportionally to how the distribution of forests age groups changed, according to the international definition of forest land used by the National Forest Inventory.

Thus we obtain 9.62%.

The final result is 616304.7531 hectares.

INCDS Marin Dracea. 2012. National Forest Inventory: Forest resources assessment in Romania, cycle I results. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

INCDS Marin Dracea. 2018. National Forest Inventory: Forest resources assessment in Romania, cycle II results. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

National Institute of Statistics.2019. Silviculture dataset. <http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table>, accessed on 07.02.2019

Food and Agriculture Organization of the United Nations. 2010. Global Forest Resources Country Report Romania 2010.

Romanian Government. 2006. Raport privind starea padurilor în România 2005.

Romanian Government. 2013. Raport privind starea padurilor României 2012.

Notes:

Forest land area values disaggregated by age groups are not available before 2005. The 2005 value should be taken with a grain of salt, since the methodology by which this value was arrived to is not the same (or of the same quality) as the methodology used in the National Forest Inventory. The distribution from 2006 to 2011 indicated by the yearly reports on the state of the Romanian forests is identical with the 2005 distribution. Since this does not reflect reality, as the distribution changes with time, I have instead relied on interpolation. The same is true for the period 2013-2017, since the distributions indicated by the yearly reports on the state of the Romanian forests is identical with the 2012 distribution. Hence, here too I have relied on interpolation.

"Forest_area_age_1-20_B" = GRAPH(TIME)

(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 1433590.0), (2006.00, 1353700.199), (2007.00, 1273361.424), (2008.00, 1182703.844), (2009.00, 1097605.654), (2010.00, 1010936.534), (2011.00, 922476.8721), (2012.00, 833268.1417), (2013.00, 814202.7798), (2014.00, 794951.4074), (2015.00, 776240.1365), (2016.00, 756759.313), (2017.00, 736760.1724), (2018.00, 716752.252)

UNITS: Hectares

DOCUMENT: Sources:

Year 2005: The National Institute of Statistics, Romanian Government (2006), and FAO (2010), indicate a total forest land area in the National Forest Fund of 6233000 hectares.

Romanian Government (2006), indicates that 23% of this land was aged 1-20 in 2005, which results in an area of 1431313 hectares.

Year 2012: The National Institute of Statistics and Romanian Government (2013) indicate a total forest land area in the National Forest Fund of 6364900 hectares.

Romanian Government (2013) indicates that 11.3% of this land was aged 1-20 in 2012. However, Romanian Government (2013) indicates National Forest Inventory (INCDS, 2012) as a source, whereas the National Forest Inventory shows very different data. It is yet unclear why the numbers differ. Until I receive answers to my queries, I must make two different reference modes, with two different assumptions regarding distributions. The data set B takes on the distribution by age group data from the National Forest Inventory, instead of the yearly reports on the state of Romanian forests.

The National Forest Inventory indicates 13.08%, thus resulting in 833268 hectares.

Year 2018: The only available data is from the National Forest Inventory (INCDS, 2018). However, they use the international definition of the term forest, not the national one. A few assumptions therefore had to be made:

Assumption 1: The total forest land area is equal to $[\text{Year 2017 value}]/[\text{Year 2016 value}] * [\text{Year 2017 value}]$ (linear extrapolation).

Thus we obtain 6405800

Assumption 2: In line with how the data for 2012 was obtained, I rely on the data from INCDS (2018).

Thus we obtain 11.19%, resulting in 716752.25 hectares.

INCDS Marin Dracea. 2012. National Forest Inventory: Forest resources assessment in Romania, cycle I results. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

INCDS Marin Dracea. 2018. National Forest Inventory: Forest resources assessment in Romania, cycle II results. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

National Institute of Statistics. 2019. Silviculture dataset. <http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table>, accessed on 07.02.2019

Food and Agriculture Organization of the United Nations. 2010. Global Forest Resources Country Report Romania 2010.

Romanian Government. 2006. Raport privind starea padurilor în România 2005.

Romanian Government. 2013. Raport privind starea padurilor României 2012.

Notes:

Forest land area values disaggregated by age groups are not available before 2005. The 2005 value should be taken with a grain of salt, since the methodology by which this value was arrived to is not the

same (or of the same quality) as the methodology used in the National Forest Inventory. The distribution from 2006 to 2011 indicated by the yearly reports on the state of the Romanian forests is identical with the 2005 distribution. Since this does not reflect reality, as the distribution changes with time, I have instead relied on interpolation. The same is true for the period 2013-2017, since the distributions indicated by the yearly reports on the state of the Romanian forests is identical with the 2012 distribution. Hence, here too I have relied on interpolation.

Forest_area_age_101_and_above_A = GRAPH(TIME)

(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 934950.0), (2006.00, 950701.4741), (2007.00, 967081.8277), (2008.00, 976076.9589), (2009.00, 989913.7125), (2010.00, 1002976.929), (2011.00, 1014746.912), (2012.00, 1026020.8), (2013.00, 1057219.62), (2014.00, 1088304.218), (2015.00, 1120292.082), (2016.00, 1151327.23), (2017.00, 1181640.183), (2018.00, 1211966.34)

UNITS: Hectares

DOCUMENT: Definition:

Sources:

Year 2005: The National Institute of Statistics, Romanian Government (2006), and FAO (2010), indicate a total forest land area in the National Forest Fund of 6233000 hectares.

Romanian Government (2006), indicates that 15% of this land was aged 101 and above in 2005, which results in an area of 934950 hectares.

Year 2012: The National Institute of Statistics and Romanian Government (2013) indicate a total forest land area in the National Forest Fund of 6364900 hectares.

Romanian Government (2013) indicates that 16.1% of this land was aged 101 and above in 2012, which results in an area of 1026020.8 hectares.

However, Romanian Government (2013) indicates National Forest Inventory (INCDS, 2012) as a source, whereas the National Forest Inventory shows very different data. It is yet unclear why the numbers differ. Until I receive answers to my queries, I must make two different reference modes, with two different assumptions regarding distributions.

Year 2018: The only available data is from the National Forest Inventory (INCDS, 2018). However, they use the international definition of the term forest, not the national one. A few assumptions therefore had to be made:

Assumption 1: The total forest land area is equal to [Year 2017 value]/[Year 2016 value]*[Year 2017 value] (linear extrapolation).

Thus we obtain 6405800

Assumption 2: The distribution of forest age groups, according to the national definition of forest land, changed proportionally to how the distribution of forests age groups changed, according to the international definition of forest land used by the National Forest Inventory.

Thus we obtain 18.92%.

The final result is 1211966.341 hectares.

INCDS Marin Dracea. 2012. National Forest Inventory: Forest resources assessment in Romania, cycle I results. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

INCDS Marin Dracea. 2018. National Forest Inventory: Forest resources assessment in Romania, cycle II results. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

National Institute of Statistics.2019. Silviculture dataset. <http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table>, accessed on 07.02.2019

Food and Agriculture Organization of the United Nations. 2010. Global Forest Resources Country Report Romania 2010.

Romanian Government. 2006. Raport privind starea padurilor în România 2005.

Romanian Government. 2013. Raport privind starea padurilor României 2012.

Notes:

Forest land area values disaggregated by age groups are not available before 2005. The 2005 value should be taken with a grain of salt, since the methodology by which this value was arrived to is not the same (or of the same quality) as the methodology used in the National Forest Inventory. The distribution from 2006 to 2011 indicated by the yearly reports on the state of the Romanian forests is identical with the 2005 distribution. Since this does not reflect reality, as the distribution changes with time, I have instead relied on interpolation. The same is true for the period 2013-2017, since the distributions indicated by the yearly reports on the state of the Romanian forests is identical with the 2012 distribution. Hence, here too I have relied on interpolation.

Forest_area_age_101_and_above_B = GRAPH(TIME)

(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 934950.0), (2006.00, 936650.4245), (2007.00, 938788.8718), (2008.00, 933677.8451), (2009.00, 933156.6513), (2010.00, 931809.9427), (2011.00, 929195.9915), (2012.00, 926087.5084), (2013.00, 956858.8436), (2014.00, 987532.5711), (2015.00, 1019032.953), (2016.00, 1049673.174), (2017.00, 1079657.535), (2018.00, 1109654.954)

UNITS: Hectares

DOCUMENT: Definition:

Sources:

Year 2005: The National Institute of Statistics, Romanian Government (2006), and FAO (2010), indicate a total forest land area in the National Forest Fund of 6233000 hectares.

Romanian Government (2006), indicates that 15% of this land was aged 101 and above in 2005, which results in an area of 934950 hectares.

Year 2012: The National Institute of Statistics and Romanian Government (2013) indicate a total forest land area in the National Forest Fund of 6364900 hectares.

Romanian Government (2013) indicates that 16.1% of this land was aged 101 and above in 2012. However, Romanian Government (2013) indicates National Forest Inventory (INCDS, 2012) as a source, whereas the National Forest Inventory shows very different data. It is yet unclear why the numbers differ. Until I receive answers to my queries, I must make two different reference modes, with

two different assumptions regarding distributions. The data set B takes on the distribution by age group data from the National Forest Inventory, instead of the yearly reports on the state of Romanian forests.

The National Forest Inventory indicates 14.53%, thus resulting in 926087 hectares.

Year 2018: The only available data is from the National Forest Inventory (INCDS, 2018). However, they use the international definition of the term forest, not the national one. A few assumptions therefore had to be made:

Assumption 1: The total forest land area is equal to [Year 2017 value]/[Year 2016 value]*[Year 2017 value] (linear extrapolation).

Thus we obtain 6405800

Assumption 2: In line with how the data for 2012 was obtained, I rely on the data from INCDS (2018).

Thus we obtain 17.32%, resulting in 1109655 hectares.

INCDS Marin Dracea. 2012. National Forest Inventory: Forest resources assessment in Romania, cycle I results. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

INCDS Marin Dracea. 2018. National Forest Inventory: Forest resources assessment in Romania, cycle II results. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

National Institute of Statistics. 2019. Silviculture dataset. <http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table>, accessed on 07.02.2019

Food and Agriculture Organization of the United Nations. 2010. Global Forest Resources Country Report Romania 2010.

Romanian Government. 2006. Raport privind starea padurilor în România 2005.

Romanian Government. 2013. Raport privind starea padurilor României 2012.

Notes:

Forest land area values disaggregated by age groups are not available before 2005. The 2005 value should be taken with a grain of salt, since the methodology by which this value was arrived to is not the same (or of the same quality) as the methodology used in the National Forest Inventory. The distribution from 2006 to 2011 indicated by the yearly reports on the state of the Romanian forests is identical with the 2005 distribution. Since this does not reflect reality, as the distribution changes with time, I have instead relied on interpolation. The same is true for the period 2013-2017, since the distributions indicated by the yearly reports on the state of the Romanian forests is identical with the 2012 distribution. Hence, here too I have relied on interpolation.

"Forest_area_age_101-120_A" = GRAPH(TIME)

(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 525647.215), (2006.00, 531803.6041), (2007.00, 538128.245), (2008.00, 540176.617), (2009.00, 544742.565), (2010.00, 548705.9323), (2011.00, 551789.0933), (2012.00, 554433.6), (2013.00, 567606.5378), (2014.00, 580710.0215), (2015.00, 594285.5362), (2016.00, 607346.5759), (2017.00, 620023.0319), (2018.00, 632704.9946)

UNITS: Hectares

DOCUMENT: Sources:

Year 2005: The National Institute of Statistics, Romanian Government (2006), and FAO (2010), indicate a total forest land area in the National Forest Fund of 6233000 hectares.

Romanian Government (2006), indicates that 15% of this land was aged 101 and above in 2005. However, we lack more disaggregated data. To fill in the gap for the age group 101-120, I have made the following assumptions:

Assumption 1. The distribution of age groups 101-120, 121-140, 141-160, 161-180, 181 and above, are proportional to the distribution of these same age groups in relation to the fraction of forests aged 101 and above in the year 2012.

Assumption 2. The distribution of the age group 101-120 follows the linear trend seen during the period 2012-2013 (linear extrapolation).

Assumption 3. An adjustment was made to ensure consistency - the sum of the distributions of age groups 101-120, 121-140, 141-160, 161-180, 181 and above equals the historical data for forests aged 101 and above.

We thus obtain a value of 8.43%, resulting in 525647.215 hectares.

Year 2012: The National Institute of Statistics and Romanian Government (2013) indicate a total forest land area in the National Forest Fund of 6364900 hectares.

Romanian Government (2013) indicates that 8.7% of this land was aged 101 to 120 in 2012, which results in an area of 554433.6 hectares.

However, Romanian Government (2013) indicates National Forest Inventory (INCDS, 2012) as a source, whereas the National Forest Inventory shows very different data. It is yet unclear why the numbers differ. Until I receive answers to my queries, I must make two different reference modes, with two different assumptions regarding distributions.

Year 2018: The only available data is from the National Forest Inventory (INCDS, 2018). However, they use the international definition of the term forest, not the national one. A few assumptions therefore had to be made:

Assumption 1: The total forest land area is equal to $[\text{Year 2017 value}]/[\text{Year 2016 value}]*[\text{Year 2017 value}]$ (linear extrapolation).

Thus we obtain 6405800

Assumption 2: The distribution of forest age groups, according to the national definition of forest land, changed proportionally to how the distribution of forests age groups changed, according to the international definition of forest land used by the National Forest Inventory.

Thus we obtain 9.87%.

The final result is 632705 hectares.

INCDS Marin Dracea. 2012. National Forest Inventory: Forest resources assessment in Romania, cycle I results. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

INCDS Marin Dracea. 2018. National Forest Inventory: Forest resources assessment in Romania, cycle II results. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

National Institute of Statistics. 2019. Silviculture dataset. <http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table>, accessed on 07.02.2019

Food and Agriculture Organization of the United Nations. 2010. Global Forest Resources Country Report Romania 2010.

Romanian Government. 2006. Raport privind starea padurilor în România 2005.

Romanian Government. 2013. Raport privind starea padurilor României 2012.

Notes:

Forest land area values disaggregated by age groups are not available before 2005. The 2005 value should be taken with a grain of salt, since the methodology by which this value was arrived to is not the same (or of the same quality) as the methodology used in the National Forest Inventory. The distribution from 2006 to 2011 indicated by the yearly reports on the state of the Romanian forests is identical with the 2005 distribution. Since this does not reflect reality, as the distribution changes with time, I have instead relied on interpolation. The same is true for the period 2013-2017, since the distributions indicated by the yearly reports on the state of the Romanian forests is identical with the 2012 distribution. Hence, here too I have relied on interpolation.

"Forest_area_age_101-120_B" = GRAPH(TIME)

(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 577713.4274), (2006.00, 574713.3305), (2007.00, 571894.5079), (2008.00, 564603.1448), (2009.00, 560044.3562), (2010.00, 554931.8276), (2011.00, 549017.5994), (2012.00, 542774.282), (2013.00, 556191.7082), (2014.00, 569542.2299), (2015.00, 583357.1344), (2016.00, 596668.3341), (2017.00, 609602.2302), (2018.00, 622541.7526)

UNITS: Hectares

DOCUMENT: Sources:

Year 2005: The National Institute of Statistics, Romanian Government (2006), and FAO (2010), indicate a total forest land area in the National Forest Fund of 6233000 hectares.

Romanian Government (2006), indicates that 15% of this land was aged 101 and above in 2005. However, we lack more disaggregated data. To fill in the gap for the age group 101-120, I have made the following assumptions:

Assumption 1. The distribution of age groups 101-120, 121-140, 141-160, 161-180, 181 and above, are proportional to the distribution of these same age groups in relation to the fraction of forests aged 101 and above in the year 2012.

Assumption 2. The distribution of the age group 101-120 follows the linear trend seen during the period 2012-2013 (linear extrapolation).

Assumption 3. An adjustment was made to ensure consistency - the sum of the distributions of age groups 101-120, 121-140, 141-160, 161-180, 181 and above equals the historical data for forests aged 101 and above.

We thus obtain a value of 9.26%, resulting in 577713 hectares.

Year 2012: The National Institute of Statistics and Romanian Government (2013) indicate a total forest land area in the National Forest Fund of 6364900 hectares.

Romanian Government (2013) indicates that 8.7% of this land was aged 101 to 120 in 2012. However, Romanian Government (2013) indicates National Forest Inventory (INCDS, 2012) as a source, whereas the National Forest Inventory shows very different data. It is yet unclear why the numbers differ. Until I receive answers to my queries, I must make two different reference modes, with two different assumptions regarding distributions. The data set B takes on the distribution by age group data from the National Forest Inventory, instead of the yearly reports on the state of Romanian forests.

The National Forest Inventory indicates 8.52%, thus resulting in 542774 hectares.

Year 2018: The only available data is from the National Forest Inventory (INCDS, 2018). However, they use the international definition of the term forest, not the national one. A few assumptions therefore had to be made:

Assumption 1: The total forest land area is equal to $[\text{Year 2017 value}]/[\text{Year 2016 value}] * [\text{Year 2017 value}]$ (linear extrapolation).

Thus we obtain 6405800

Assumption 2: In line with how the data for 2012 was obtained, I rely on the data from INCDS (2018).

Thus we obtain 9.72%, resulting in 622541 hectares.

INCDS Marin Dracea. 2012. National Forest Inventory: Forest resources assessment in Romania, cycle I results. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

INCDS Marin Dracea. 2018. National Forest Inventory: Forest resources assessment in Romania, cycle II results. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

National Institute of Statistics. 2019. Silviculture dataset. <http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table>, accessed on 07.02.2019

Food and Agriculture Organization of the United Nations. 2010. Global Forest Resources Country Report Romania 2010.

Romanian Government. 2006. Raport privind starea padurilor în România 2005.

Romanian Government. 2013. Raport privind starea padurilor României 2012.

Notes:

Forest land area values disaggregated by age groups are not available before 2005. The 2005 value should be taken with a grain of salt, since the methodology by which this value was arrived to is not the same (or of the same quality) as the methodology used in the National Forest Inventory. The distribution from 2006 to 2011 indicated by the yearly reports on the state of the Romanian forests is identical with the 2005 distribution. Since this does not reflect reality, as the distribution changes with time, I have instead relied on interpolation. The same is true for the period 2013-2017, since the distributions indicated by the yearly reports on the state of the Romanian forests is identical with the 2012 distribution. Hence, here too I have relied on interpolation.

"Forest_area_age_121-140_A" = GRAPH(TIME)
(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 182792.2116),
(2006.00, 190328.1577), (2007.00, 198210.2057), (2008.00, 204769.1155), (2009.00, 212524.2206),
(2010.00, 220315.5895), (2011.00, 228016.9478), (2012.00, 235793.6), (2013.00, 248438.1617),
(2014.00, 261067.9788), (2015.00, 273929.2238), (2016.00, 286571.0134), (2017.00, 299038.419),
(2018.00, 311511.268)

UNITS: Hectares

DOCUMENT: Sources:

Year 2005: The National Institute of Statistics, Romanian Government (2006), and FAO (2010), indicate a total forest land area in the National Forest Fund of 6233000 hectares.

Romanian Government (2006), indicates that 15% of this land was aged 101 and above in 2005. However, we lack more disaggregated data. To fill in the gap for the age group 121-140, I have made the following assumptions:

Assumption 1. The distribution of age groups 101-120, 121-140, 141-160, 161-180, 181 and above, are proportional to the distribution of these same age groups in relation to the fraction of forests aged 101 and above in the year 2012.

Assumption 2. The distribution of the age group 121-140 follows the linear trend seen during the period 2012-2013 (linear extrapolation).

Assumption 3. An adjustment was made to ensure consistency - the sum of the distributions of age groups 101-120, 121-140, 141-160, 161-180, 181 and above equals the historical data for forests aged 101 and above.

We thus obtain a value of 2.93%, resulting in 182792.2 hectares.

Year 2012: The National Institute of Statistics and Romanian Government (2013) indicate a total forest land area in the National Forest Fund of 6364900 hectares.

Romanian Government (2013) indicates that 3.7% of this land was aged 121 to 140 in 2012, which results in an area of 235793.6 hectares.

However, Romanian Government (2013) indicates National Forest Inventory (INCDS, 2012) as a source, whereas the National Forest Inventory shows very different data. It is yet unclear why the numbers differ. Until I receive answers to my queries, I must make two different reference modes, with two different assumptions regarding distributions.

Year 2018: The only available data is from the National Forest Inventory (INCDS, 2018). However, they use the international definition of the term forest, not the national one. A few assumptions therefore had to be made:

Assumption 1: The total forest land area is equal to [Year 2017 value]/[Year 2016 value]*[Year 2017 value] (linear extrapolation).

Thus we obtain 6405800

Assumption 2: The distribution of forest age groups, according to the national definition of forest land, changed proportionally to how the distribution of forests age groups changed, according to the international definition of forest land used by the National Forest Inventory.

Thus we obtain 4.86%.

The final result is 311511.3 hectares.

INCDS Marin Dracea. 2012. National Forest Inventory: Forest resources assessment in Romania, cycle I results. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

INCDS Marin Dracea. 2018. National Forest Inventory: Forest resources assessment in Romania, cycle II results. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

National Institute of Statistics. 2019. Silviculture dataset. <http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table>, accessed on 07.02.2019

Food and Agriculture Organization of the United Nations. 2010. Global Forest Resources Country Report Romania 2010.

Romanian Government. 2006. Raport privind starea padurilor în România 2005.

Romanian Government. 2013. Raport privind starea padurilor României 2012.

Notes:

Forest land area values disaggregated by age groups are not available before 2005. The 2005 value should be taken with a grain of salt, since the methodology by which this value was arrived to is not the same (or of the same quality) as the methodology used in the National Forest Inventory. The distribution from 2006 to 2011 indicated by the yearly reports on the state of the Romanian forests is identical with the 2005 distribution. Since this does not reflect reality, as the distribution changes with time, I have instead relied on interpolation. The same is true for the period 2013-2017, since the distributions indicated by the yearly reports on the state of the Romanian forests is identical with the 2012 distribution. Hence, here too I have relied on interpolation.

"Forest_area_age_121-140_B" = GRAPH(TIME)

(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 200438.1587), (2006.00, 205238.3494), (2007.00, 210214.4012), (2008.00, 213613.7075), (2009.00, 218095.9237), (2010.00, 222435.4761), (2011.00, 226511.3561), (2012.00, 230495.4007), (2013.00, 243112.2302), (2014.00, 255715.1786), (2015.00, 268545.4783), (2016.00, 281161.2231), (2017.00, 293606.1148), (2018.00, 306056.434)

UNITS: Hectares

DOCUMENT: Sources:

Year 2005: The National Institute of Statistics, Romanian Government (2006), and FAO (2010), indicate a total forest land area in the National Forest Fund of 6233000 hectares.

Romanian Government (2006), indicates that 15% of this land was aged 101 and above in 2005. However, we lack more disaggregated data. To fill in the gap for the age group 121-140, I have made the following assumptions:

Assumption 1. The distribution of age groups 101-120, 121-140, 141-160, 161-180, 181 and above, are proportional to the distribution of these same age groups in relation to the fraction of forests aged 101 and above in the year 2012.

Assumption 2. The distribution of the age group 121-140 follows the linear trend seen during the period 2012-2013 (linear extrapolation).

Assumption 3. An adjustment was made to ensure consistency - the sum of the distributions of age groups 101-120, 121-140, 141-160, 161-180, 181 and above equals the historical data for forests aged 101 and above.

We thus obtain a value of 3.21%, resulting in 200438 hectares.

Year 2012: The National Institute of Statistics and Romanian Government (2013) indicate a total forest land area in the National Forest Fund of 6364900 hectares.

Romanian Government (2013) indicates that 3.7% of this land was aged 121 to 140 in 2012. However, Romanian Government (2013) indicates National Forest Inventory (INCDS, 2012) as a source, whereas the National Forest Inventory shows very different data. It is yet unclear why the numbers differ. Until I receive answers to my queries, I must make two different reference modes, with two different assumptions regarding distributions. The data set B takes on the distribution by age group data from the National Forest Inventory, instead of the yearly reports on the state of Romanian forests.

The National Forest Inventory indicates 3.62%, thus resulting in 230495 hectares.

Year 2018: The only available data is from the National Forest Inventory (INCDS, 2018). However, they use the international definition of the term forest, not the national one. A few assumptions therefore had to be made:

Assumption 1: The total forest land area is equal to $[\text{Year 2017 value}]/[\text{Year 2016 value}] * [\text{Year 2017 value}]$ (linear extrapolation).

Thus we obtain 6405800

Assumption 2: In line with how the data for 2012 was obtained, I rely on the data from INCDS (2018).

Thus we obtain 4.78%, resulting in 306056 hectares.

INCDS Marin Dracea. 2012. National Forest Inventory: Forest resources assessment in Romania, cycle I results. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

INCDS Marin Dracea. 2018. National Forest Inventory: Forest resources assessment in Romania, cycle II results. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

National Institute of Statistics. 2019. Silviculture dataset. <http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table>, accessed on 07.02.2019

Food and Agriculture Organization of the United Nations. 2010. Global Forest Resources Country Report Romania 2010.

Romanian Government. 2006. Raport privind starea padurilor în România 2005.

Romanian Government. 2013. Raport privind starea padurilor României 2012.

Notes:

Forest land area values disaggregated by age groups are not available before 2005. The 2005 value should be taken with a grain of salt, since the methodology by which this value was arrived to is not the same (or of the same quality) as the methodology used in the National Forest Inventory. The distribution from 2006 to 2011 indicated by the yearly reports on the state of the Romanian forests is identical with the 2005 distribution. Since this does not reflect reality, as the distribution changes with time, I have instead relied on interpolation. The same is true for the period 2013-2017, since the distributions indicated by the yearly reports on the state of the Romanian forests is identical with the 2012 distribution. Hence, here too I have relied on interpolation.

"Forest_area_age_141-160_A" = GRAPH(TIME)

(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 91926.52165), (2006.00, 94488.95672), (2007.00, 97140.17434), (2008.00, 99067.72298), (2009.00, 101501.1655), (2010.00, 103873.007), (2011.00, 106125.4338), (2012.00, 108337.6), (2013.00, 112683.5144), (2014.00, 117019.5708), (2015.00, 121455.5908), (2016.00, 125790.9082), (2017.00, 130048.3608), (2018.00, 134307.6687)

UNITS: Hectares

DOCUMENT: Sources:

Year 2005: The National Institute of Statistics, Romanian Government (2006), and FAO (2010), indicate a total forest land area in the National Forest Fund of 6233000 hectares.

Romanian Government (2006), indicates that 15% of this land was aged 101 and above in 2005. However, we lack more disaggregated data. To fill in the gap for the age group 141-160, I have made the following assumptions:

Assumption 1. The distribution of age groups 101-120, 121-140, 141-160, 161-180, 181 and above, are proportional to the distribution of these same age groups in relation to the fraction of forests aged 101 and above in the year 2012.

Assumption 2. The distribution of the age group 141-160 follows the linear trend seen during the period 2012-2013 (linear extrapolation).

Assumption 3. An adjustment was made to ensure consistency - the sum of the distributions of age groups 101-120, 121-140, 141-160, 161-180, 181 and above equals the historical data for forests aged 101 and above.

We thus obtain a value of 1.47%, resulting in 91926.5 hectares.

Year 2012: The National Institute of Statistics and Romanian Government (2013) indicate a total forest land area in the National Forest Fund of 6364900 hectares.

Romanian Government (2013) indicates that 1.7% of this land was aged 141 to 160 in 2012, which results in an area of 108337.6 hectares.

However, Romanian Government (2013) indicates National Forest Inventory (INCDS, 2012) as a source, whereas the National Forest Inventory shows very different data. It is yet unclear why the

numbers differ. Until I receive answers to my queries, I must make two different reference modes, with two different assumptions regarding distributions.

Year 2018: The only available data is from the National Forest Inventory (INCDS, 2018). However, they use the international definition of the term forest, not the national one. A few assumptions therefore had to be made:

Assumption 1: The total forest land area is equal to [Year 2017 value]/[Year 2016 value]*[Year 2017 value] (linear extrapolation).

Thus we obtain 6405800

Assumption 2: The distribution of forest age groups, according to the national definition of forest land, changed proportionally to how the distribution of forests age groups changed, according to the international definition of forest land used by the National Forest Inventory.

Thus we obtain 2.1%.

The final result is 134307.6 hectares.

INCDS Marin Dracea. 2012. National Forest Inventory: Forest resources assessment in Romania, cycle I results. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

INCDS Marin Dracea. 2018. National Forest Inventory: Forest resources assessment in Romania, cycle II results. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

National Institute of Statistics.2019. Silviculture dataset. <http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table>, accessed on 07.02.2019

Food and Agriculture Organization of the United Nations. 2010. Global Forest Resources Country Report Romania 2010.

Romanian Government. 2006. Raport privind starea padurilor în România 2005.

Romanian Government. 2013. Raport privind starea padurilor României 2012.

Notes:

Forest land area values disaggregated by age groups are not available before 2005. The 2005 value should be taken with a grain of salt, since the methodology by which this value was arrived to is not the same (or of the same quality) as the methodology used in the National Forest Inventory. The distribution from 2006 to 2011 indicated by the yearly reports on the state of the Romanian forests is identical with the 2005 distribution. Since this does not reflect reality, as the distribution changes with time, I have instead relied on interpolation. The same is true for the period 2013-2017, since the distributions indicated by the yearly reports on the state of the Romanian forests is identical with the 2012 distribution. Hence, here too I have relied on interpolation.

"Forest_area_age_141-160_B" = GRAPH(TIME)

(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 99528.83072), (2006.00, 100600.2907), (2007.00, 101712.7492), (2008.00, 102026.8053), (2009.00, 102826.4727), (2010.00, 103522.2446), (2011.00, 104061.9142), (2012.00, 104528.8897), (2013.00, 108831.1186), (2014.00, 113124.0779), (2015.00, 117513.9492), (2016.00, 121806.6605), (2017.00, 126024.0643), (2018.00, 130243.3125)

UNITS: Hectares

DOCUMENT: Sources:

Year 2005: The National Institute of Statistics, Romanian Government (2006), and FAO (2010), indicate a total forest land area in the National Forest Fund of 6233000 hectares.

Romanian Government (2006), indicates that 15% of this land was aged 101 and above in 2005. However, we lack more disaggregated data. To fill in the gap for the age group 141-160, I have made the following assumptions:

Assumption 1. The distribution of age groups 101-120, 121-140, 141-160, 161-180, 181 and above, are proportional to the distribution of these same age groups in relation to the fraction of forests aged 101 and above in the year 2012.

Assumption 2. The distribution of the age group 141-160 follows the linear trend seen during the period 2012-2013 (linear extrapolation).

Assumption 3. An adjustment was made to ensure consistency - the sum of the distributions of age groups 101-120, 121-140, 141-160, 161-180, 181 and above equals the historical data for forests aged 101 and above.

We thus obtain a value of 1.59%, resulting in 99528 hectares.

Year 2012: The National Institute of Statistics and Romanian Government (2013) indicate a total forest land area in the National Forest Fund of 6364900 hectares.

Romanian Government (2013) indicates that 1.7% of this land was aged 141 to 160 in 2012. However, Romanian Government (2013) indicates National Forest Inventory (INCDS, 2012) as a source, whereas the National Forest Inventory shows very different data. It is yet unclear why the numbers differ. Until I receive answers to my queries, I must make two different reference modes, with two different assumptions regarding distributions. The data set B takes on the distribution by age group data from the National Forest Inventory, instead of the yearly reports on the state of Romanian forests.

The National Forest Inventory indicates 1.64%, thus resulting in 104529 hectares.

Year 2018: The only available data is from the National Forest Inventory (INCDS, 2018). However, they use the international definition of the term forest, not the national one. A few assumptions therefore had to be made:

Assumption 1: The total forest land area is equal to $[\text{Year 2017 value}]/[\text{Year 2016 value}]*[\text{Year 2017 value}]$ (linear extrapolation).

Thus we obtain 6405800

Assumption 2: In line with how the data for 2012 was obtained, I rely on the data from INCDS (2018).

Thus we obtain 2.03%, resulting in 130243 hectares.

INCDS Marin Dracea. 2012. National Forest Inventory: Forest resources assessment in Romania, cycle I results. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

INCDS Marin Dracea. 2018. National Forest Inventory: Forest resources assessment in Romania, cycle II results. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

National Institute of Statistics. 2019. Silviculture dataset. <http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table>, accessed on 07.02.2019

Food and Agriculture Organization of the United Nations. 2010. Global Forest Resources Country Report Romania 2010.

Romanian Government. 2006. Raport privind starea padurilor în România 2005.

Romanian Government. 2013. Raport privind starea padurilor României 2012.

Notes:

Forest land area values disaggregated by age groups are not available before 2005. The 2005 value should be taken with a grain of salt, since the methodology by which this value was arrived to is not the same (or of the same quality) as the methodology used in the National Forest Inventory. The distribution from 2006 to 2011 indicated by the yearly reports on the state of the Romanian forests is identical with the 2005 distribution. Since this does not reflect reality, as the distribution changes with time, I have instead relied on interpolation. The same is true for the period 2013-2017, since the distributions indicated by the yearly reports on the state of the Romanian forests is identical with the 2012 distribution. Hence, here too I have relied on interpolation.

Forest_area_age_161_and_above_A = GRAPH(TIME)

(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 134584.0455), (2006.00, 134080.743), (2007.00, 133603.2026), (2008.00, 132063.4971), (2009.00, 131145.7614), (2010.00, 130082.4007), (2011.00, 128815.4367), (2012.00, 127456.0), (2013.00, 128491.3998), (2014.00, 129506.6529), (2015.00, 130621.731), (2016.00, 131618.7265), (2017.00, 132530.3777), (2018.00, 133442.4148)

UNITS: Hectares

DOCUMENT: Definition:

Sources:

Year 2005: The National Institute of Statistics, Romanian Government (2006), and FAO (2010), indicate a total forest land area in the National Forest Fund of 6233000 hectares.

Romanian Government (2006), indicates that 15% of this land was aged 101 and above in 2005. However, we lack more disaggregated data. To fill in the gap for the age group 161 and above, I have made the following assumptions:

Assumption 1. The distribution of age groups 101-120, 121-140, 141-160, 161-180, 181 and above, are proportional to the distribution of these same age groups in relation to the fraction of forests aged 101 and above in the year 2012.

Assumption 2. The distribution of the age group 161 and above follows the linear trend seen during the period 2012-2013 (linear extrapolation).

Assumption 3. An adjustment was made to ensure consistency - the sum of the distributions of age groups 101-120, 121-140, 141-160, 161-180, 181 and above equals the historical data for forests aged 101 and above.

We thus obtain a value of 2.15%, resulting in 134584 hectares.

Year 2012: The National Institute of Statistics and Romanian Government (2013) indicate a total forest land area in the National Forest Fund of 6364900 hectares.

Romanian Government (2013) indicates that 2% of this land was aged 161 and above in 2012, which results in an area of 127456 hectares.

However, Romanian Government (2013) indicates National Forest Inventory (INCDS, 2012) as a source, whereas the National Forest Inventory shows very different data. It is yet unclear why the numbers differ. Until I receive answers to my queries, I must make two different reference modes, with two different assumptions regarding distributions.

Year 2018: The only available data is from the National Forest Inventory (INCDS, 2018). However, they use the international definition of the term forest, not the national one. A few assumptions therefore had to be made:

Assumption 1: The total forest land area is equal to $[\text{Year 2017 value}]/[\text{Year 2016 value}]*[\text{Year 2017 value}]$ (linear extrapolation).

Thus we obtain 6405800

Assumption 2: The distribution of forest age groups, according to the national definition of forest land, changed proportionally to how the distribution of forests age groups changed, according to the international definition of forest land used by the National Forest Inventory.

Thus we obtain 2.08%.

The final result is 133442 hectares.

INCDS Marin Dracea. 2012. National Forest Inventory: Forest resources assessment in Romania, cycle I results. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

INCDS Marin Dracea. 2018. National Forest Inventory: Forest resources assessment in Romania, cycle II results. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

National Institute of Statistics. 2019. Silviculture dataset. <http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table>, accessed on 07.02.2019

Food and Agriculture Organization of the United Nations. 2010. Global Forest Resources Country Report Romania 2010.

Romanian Government. 2006. Raport privind starea padurilor în România 2005.

Romanian Government. 2013. Raport privind starea padurilor României 2012.

Notes:

Forest land area values disaggregated by age groups are not available before 2005. The 2005 value should be taken with a grain of salt, since the methodology by which this value was arrived to is not the same (or of the same quality) as the methodology used in the National Forest Inventory. The distribution from 2006 to 2011 indicated by the yearly reports on the state of the Romanian forests is identical with the 2005 distribution. Since this does not reflect reality, as the distribution changes with time, I have instead relied on interpolation. The same is true for the period 2013-2017, since the distributions indicated by the yearly reports on the state of the Romanian forests is identical with the 2012 distribution. Hence, here too I have relied on interpolation.

Forest_area_age_161_and_above_B = GRAPH(TIME)

(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 57269.58313), (2006.00, 56098.46018), (2007.00, 54967.21348), (2008.00, 53434.1875), (2009.00, 52189.89876), (2010.00, 50920.39437), (2011.00, 49605.12184), (2012.00, 48288.93608), (2013.00, 48723.78018), (2014.00, 49151.0783), (2015.00, 49616.39118), (2016.00, 50036.95597), (2017.00, 50425.12519), (2018.00, 50813.45532)

UNITS: Hectares

DOCUMENT: Definition:

Sources:

Year 2005: The National Institute of Statistics, Romanian Government (2006), and FAO (2010), indicate a total forest land area in the National Forest Fund of 6233000 hectares.

Romanian Government (2006), indicates that 15% of this land was aged 101 and above in 2005. However, we lack more disaggregated data. To fill in the gap for the age group 161 and above, I have made the following assumptions:

Assumption 1. The distribution of age groups 101-120, 121-140, 141-160, 161-180, 181 and above, are proportional to the distribution of these same age groups in relation to the fraction of forests aged 101 and above in the year 2012.

Assumption 2. The distribution of the age group 161 and above follows the linear trend seen during the period 2012-2013 (linear extrapolation).

Assumption 3. An adjustment was made to ensure consistency - the sum of the distributions of age groups 101-120, 121-140, 141-160, 161-180, 181 and above equals the historical data for forests aged 101 and above.

We thus obtain a value of 0.91%, resulting in 31498 hectares.

Year 2012: The National Institute of Statistics and Romanian Government (2013) indicate a total forest land area in the National Forest Fund of 6364900 hectares.

Romanian Government (2013) indicates that 2% of this land was aged 161 and above in 2012. However, Romanian Government (2013) indicates National Forest Inventory (INCDS, 2012) as a source, whereas the National Forest Inventory shows very different data. It is yet unclear why the numbers differ. Until I receive answers to my queries, I must make two different reference modes, with two different assumptions regarding distributions. The data set B takes on the distribution by age group data from the National Forest Inventory, instead of the yearly reports on the state of Romanian forests.

The National Forest Inventory indicates 0.76%, thus resulting in 48289 hectares.

Year 2018: The only available data is from the National Forest Inventory (INCDS, 2018). However, they use the international definition of the term forest, not the national one. A few assumptions therefore had to be made:

Assumption 1: The total forest land area is equal to [Year 2017 value]/[Year 2016 value]*[Year 2017 value] (linear extrapolation).

Thus we obtain 6405800

Assumption 2: In line with how the data for 2012 was obtained, I rely on the data from INCDS (2018).

Thus we obtain 0.79%, resulting in 50813 hectares.

INCDS Marin Dracea. 2012. National Forest Inventory: Forest resources assessment in Romania, cycle I results. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

INCDS Marin Dracea. 2018. National Forest Inventory: Forest resources assessment in Romania, cycle II results. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

National Institute of Statistics. 2019. Silviculture dataset. <http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table>, accessed on 07.02.2019

Food and Agriculture Organization of the United Nations. 2010. Global Forest Resources Country Report Romania 2010.

Romanian Government. 2006. Raport privind starea padurilor în România 2005.

Romanian Government. 2013. Raport privind starea padurilor României 2012.

Notes:

Forest land area values disaggregated by age groups are not available before 2005. The 2005 value should be taken with a grain of salt, since the methodology by which this value was arrived to is not the same (or of the same quality) as the methodology used in the National Forest Inventory. The distribution from 2006 to 2011 indicated by the yearly reports on the state of the Romanian forests is identical with the 2005 distribution. Since this does not reflect reality, as the distribution changes with time, I have instead relied on interpolation. The same is true for the period 2013-2017, since the distributions indicated by the yearly reports on the state of the Romanian forests is identical with the 2012 distribution. Hence, here too I have relied on interpolation.

"Forest_area_age_161-180_A" = GRAPH(TIME)

(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 60562.81984), (2006.00, 60336.3334), (2007.00, 60121.44118), (2008.00, 59428.57622), (2009.00, 59015.59451), (2010.00, 58537.07651), (2011.00, 57966.94557), (2012.00, 57355.2), (2013.00, 57821.13119), (2014.00, 58277.99347), (2015.00, 58779.77992), (2016.00, 59228.42917), (2017.00, 59638.67061), (2018.00, 60049.08858)

UNITS: Hectares

DOCUMENT: Sources:

Year 2005: The National Institute of Statistics, Romanian Government (2006), and FAO (2010), indicate a total forest land area in the National Forest Fund of 6233000 hectares.

Romanian Government (2006), indicates that 15% of this land was aged 101 and above in 2005. However, we lack more disaggregated data. To fill in the gap for the age group 161-180, I have made the following assumptions:

Assumption 1. The distribution of age groups 101-120, 121-140, 141-160, 161-180, 181 and above, are proportional to the distribution of these same age groups in relation to the fraction of forests aged 101 and above in the year 2012.

Assumption 2. The distribution of the age group 161-180 follows the linear trend seen during the period 2012-2013 (linear extrapolation).

Assumption 3. An adjustment was made to ensure consistency - the sum of the distributions of age groups 101-120, 121-140, 141-160, 161-180, 181 and above equals the historical data for forests aged 101 and above.

We thus obtain a value of 0.97%, resulting in 60562.82 hectares.

Year 2012: The National Institute of Statistics and Romanian Government (2013) indicate a total forest land area in the National Forest Fund of 6364900 hectares.

Romanian Government (2013) indicates that 0.9% of this land was aged 161 to 180 in 2012, which results in an area of 57355.2 hectares.

However, Romanian Government (2013) indicates National Forest Inventory (INCDS, 2012) as a source, whereas the National Forest Inventory shows very different data. It is yet unclear why the numbers differ. Until I receive answers to my queries, I must make two different reference modes, with two different assumptions regarding distributions.

Year 2018: The only available data is from the National Forest Inventory (INCDS, 2018). However, they use the international definition of the term forest, not the national one. Furthermore, the National Forest Inventory does not disaggregate to the age groups 161-180 and 181 and above, instead having only 161 and above. A few assumptions therefore had to be made:

Assumption 1: The total forest land area is equal to $[\text{Year 2017 value}]/[\text{Year 2016 value}] * [\text{Year 2017 value}]$ (linear extrapolation).

Thus we obtain 6405800

Assumption 2: The distribution of forest age groups, according to the national definition of forest land, changed proportionally to how the distribution of forests age groups changed, according to the international definition of forest land used by the National Forest Inventory.

Assumption 3: The ratio between the [fraction of forests age 161-180] from Romanian Government (2013) and [fraction of forests aged 161 and above] from INCDS (2012, 2018) remains the same in 2018 as it was in 2012.

Thus we obtain 0.94%.

The final result is 60049 hectares.

INCDS Marin Dracea. 2012. National Forest Inventory: Forest resources assessment in Romania, cycle I results. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

INCDS Marin Dracea. 2018. National Forest Inventory: Forest resources assessment in Romania, cycle II results. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

National Institute of Statistics. 2019. Silviculture dataset. <http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table>, accessed on 07.02.2019

Food and Agriculture Organization of the United Nations. 2010. Global Forest Resources Country Report Romania 2010.

Romanian Government. 2006. Raport privind starea padurilor în România 2005.

Romanian Government. 2013. Raport privind starea padurilor României 2012.

Notes:

Forest land area values disaggregated by age groups are not available before 2005. The 2005 value should be taken with a grain of salt, since the methodology by which this value was arrived to is not the same (or of the same quality) as the methodology used in the National Forest Inventory. The distribution from 2006 to 2011 indicated by the yearly reports on the state of the Romanian forests is identical with the 2005 distribution. Since this does not reflect reality, as the distribution changes with time, I have instead relied on interpolation. The same is true for the period 2013-2017, since the distributions indicated by the yearly reports on the state of the Romanian forests is identical with the 2012 distribution. Hence, here too I have relied on interpolation.

"Forest_area_age_161-180_B" = GRAPH(TIME)

(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 25771.31085), (2006.00, 25244.30771), (2007.00, 24735.24859), (2008.00, 24045.38185), (2009.00, 23485.45223), (2010.00, 22914.18064), (2011.00, 22322.3026), (2012.00, 21730.01805), (2013.00, 21925.70044), (2014.00, 22117.98715), (2015.00, 22327.37763), (2016.00, 22516.62795), (2017.00, 22691.30377), (2018.00, 22866.0549)

UNITS: Hectares

DOCUMENT: Sources:

Year 2005: The National Institute of Statistics, Romanian Government (2006), and FAO (2010), indicate a total forest land area in the National Forest Fund of 6233000 hectares.

Romanian Government (2006), indicates that 15% of this land was aged 101 and above in 2005. However, we lack more disaggregated data. To fill in the gap for the age group 161-180, I have made the following assumptions:

Assumption 1. The distribution of age groups 101-120, 121-140, 141-160, 161-180, 181 and above, are proportional to the distribution of these same age groups in relation to the fraction of forests aged 101 and above in the year 2012.

Assumption 2. The distribution of the age group 161-180 follows the linear trend seen during the period 2012-2013 (linear extrapolation).

Assumption 3. An adjustment was made to ensure consistency - the sum of the distributions of age groups 101-120, 121-140, 141-160, 161-180, 181 and above equals the historical data for forests aged 101 and above.

We thus obtain a value of 0.41%, resulting in 25771 hectares.

Year 2012: The National Institute of Statistics and Romanian Government (2013) indicate a total forest land area in the National Forest Fund of 6364900 hectares.

Romanian Government (2013) indicates that 0.9% of this land was aged 161 to 180 in 2012. However, Romanian Government (2013) indicates National Forest Inventory (INCDS, 2012) as a source, whereas the National Forest Inventory shows very different data. It is yet unclear why the numbers differ. Until I receive answers to my queries, I must make two different reference modes, with two different assumptions regarding distributions. The data set B takes on the distribution by age group data from the National Forest Inventory, instead of the yearly reports on the state of Romanian forests. Furthermore, the National Forest Inventory does not disaggregate to the age groups 161-180 and 181 and above, instead having only 161 and above.

I therefore estimated this value based on the value for [forest area age 161 and over] from INCDS (2018), and the ratio between [forest area age 161 to 180] and [forest area age 161 and above] from Romanian Government (2013).

We thus obtain 0.34%, resulting in an area of 21730 hectares.

Year 2018: The only available data is from the National Forest Inventory (INCDS, 2018). However, they use the international definition of the term forest, not the national one. Furthermore, the National Forest Inventory does not disaggregate to the age groups 161-180 and 181 and above, instead having only 161 and above. A few assumptions therefore had to be made:

Assumption 1: The total forest land area is equal to [Year 2017 value]/[Year 2016 value]*[Year 2017 value] (linear extrapolation).

Thus we obtain 6405800

Assumption 2: The ratio between the [fraction of forests age 161-180] from Romanian Government (2013) and [fraction of forests aged 161 and above] from INCDS (2012, 2018) remains the same in 2018 as it was in 2012.

I then estimated the area based on the value for [forest area age 161 and over] from INCDS (2018), and the ratio between [forest area age 161 to 180] and [forest area age 161 and above] from Romanian Government (2013).

Thus we obtain 0.36%, resulting in 22866 hectares.

INCDS Marin Dracea. 2012. National Forest Inventory: Forest resources assessment in Romania, cycle I results. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

INCDS Marin Dracea. 2018. National Forest Inventory: Forest resources assessment in Romania, cycle II results. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

National Institute of Statistics.2019. Silviculture dataset. <http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table>, accessed on 07.02.2019

Food and Agriculture Organization of the United Nations. 2010. Global Forest Resources Country Report Romania 2010.

Romanian Government. 2006. Raport privind starea padurilor în România 2005.

Romanian Government. 2013. Raport privind starea padurilor României 2012.

Notes:

Forest land area values disaggregated by age groups are not available before 2005. The 2005 value should be taken with a grain of salt, since the methodology by which this value was arrived to is not the same (or of the same quality) as the methodology used in the National Forest Inventory. The distribution from 2006 to 2011 indicated by the yearly reports on the state of the Romanian forests is identical with the 2005 distribution. Since this does not reflect reality, as the distribution changes with time, I have instead relied on interpolation. The same is true for the period 2013-2017, since the distributions indicated by the yearly reports on the state of the Romanian forests is identical with the 2012 distribution. Hence, here too I have relied on interpolation.

Forest_area_age_181_and_above_A = GRAPH(TIME)

(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 74021.22563), (2006.00, 73744.40958), (2007.00, 73481.76144), (2008.00, 72634.92088), (2009.00, 72130.16685), (2010.00, 71545.31785), (2011.00, 70848.49115), (2012.00, 70100.8), (2013.00, 70670.26862), (2014.00, 71228.65939), (2015.00, 71841.95111), (2016.00, 72390.30374), (2017.00, 72891.7071), (2018.00, 73393.32621)

UNITS: Hectares

DOCUMENT: Sources:

Year 2005: The National Institute of Statistics, Romanian Government (2006), and FAO (2010), indicate a total forest land area in the National Forest Fund of 6233000 hectares.

Romanian Government (2006), indicates that 15% of this land was aged 101 and above in 2005. However, we lack more disaggregated data. To fill in the gap for the age group 181 and above, I have made the following assumptions:

Assumption 1. The distribution of age groups 101-120, 121-140, 141-160, 161-180, 181 and above, are proportional to the distribution of these same age groups in relation to the fraction of forests aged 101 and above in the year 2012.

Assumption 2. The distribution of the age group 181 and above follows the linear trend seen during the period 2012-2013 (linear extrapolation).

Assumption 3. An adjustment was made to ensure consistency - the sum of the distributions of age groups 101-120, 121-140, 141-160, 161-180, 181 and above equals the historical data for forests aged 101 and above.

We thus obtain a value of 1.18%, resulting in 74021.23 hectares.

Year 2012: The National Institute of Statistics and Romanian Government (2013) indicate a total forest land area in the National Forest Fund of 6364900 hectares.

Romanian Government (2013) indicates that 1.1% of this land was aged 181 and above in 2012, which results in an area of 70100.8 hectares.

However, Romanian Government (2013) indicates National Forest Inventory (INCDS, 2012) as a source, whereas the National Forest Inventory shows very different data. It is yet unclear why the numbers differ. Until I receive answers to my queries, I must make two different reference modes, with two different assumptions regarding distributions.

Year 2018: The only available data is from the National Forest Inventory (INCDS, 2018). However, they use the international definition of the term forest, not the national one. Furthermore, the National Forest Inventory does not disaggregate to the age groups 161-180 and 181 and above, instead having only 161 and above. A few assumptions therefore had to be made:

Assumption 1: The total forest land area is equal to $[\text{Year 2017 value}]/[\text{Year 2016 value}]*[\text{Year 2017 value}]$ (linear extrapolation).

Thus we obtain 6405800

Assumption 2: The distribution of forest age groups, according to the national definition of forest land, changed proportionally to how the distribution of forests age groups changed, according to the international definition of forest land used by the National Forest Inventory.

Assumption 3: The ratio between the [fraction of forests age 181 and above] from Romanian Government (2013) and [fraction of forests aged 161 and above] from INCDS (2012, 2018) remains the same in 2018 as it was in 2012.

Thus we obtain 1.15%.

The final result is 73393.3 hectares.

INCDS Marin Dracea. 2012. National Forest Inventory: Forest resources assessment in Romania, cycle I results. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

INCDS Marin Dracea. 2018. National Forest Inventory: Forest resources assessment in Romania, cycle II results. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

National Institute of Statistics.2019. Silviculture dataset. <http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table>, accessed on 07.02.2019

Food and Agriculture Organization of the United Nations. 2010. Global Forest Resources Country Report Romania 2010.

Romanian Government. 2006. Raport privind starea padurilor în România 2005.

Romanian Government. 2013. Raport privind starea padurilor României 2012.

Notes:

Forest land area values disaggregated by age groups are not available before 2005. The 2005 value should be taken with a grain of salt, since the methodology by which this value was arrived to is not the same (or of the same quality) as the methodology used in the National Forest Inventory. The distribution from 2006 to 2011 indicated by the yearly reports on the state of the Romanian forests is identical with

the 2005 distribution. Since this does not reflect reality, as the distribution changes with time, I have instead relied on interpolation. The same is true for the period 2013-2017, since the distributions indicated by the yearly reports on the state of the Romanian forests is identical with the 2012 distribution. Hence, here too I have relied on interpolation.

Forest_area_age_181_and_above_B = GRAPH(TIME)

(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 31498.27228), (2006.00, 30854.15247), (2007.00, 30231.96489), (2008.00, 29388.80565), (2009.00, 28704.44654), (2010.00, 28006.22008), (2011.00, 27282.81924), (2012.00, 26558.91166), (2013.00, 26798.07974), (2014.00, 27033.09754), (2015.00, 27289.01355), (2016.00, 27520.32803), (2017.00, 27733.81501), (2018.00, 27947.40043)

UNITS: Hectares

DOCUMENT: Sources:

Year 2005: The National Institute of Statistics, Romanian Government (2006), and FAO (2010), indicate a total forest land area in the National Forest Fund of 6233000 hectares.

Romanian Government (2006), indicates that 15% of this land was aged 101 and above in 2005. However, we lack more disaggregated data. To fill in the gap for the age group 181 and above, I have made the following assumptions:

Assumption 1. The distribution of age groups 101-120, 121-140, 141-160, 161-180, 181 and above, are proportional to the distribution of these same age groups in relation to the fraction of forests aged 101 and above in the year 2012.

Assumption 2. The distribution of the age group 181 and above follows the linear trend seen during the period 2012-2013 (linear extrapolation).

Assumption 3. An adjustment was made to ensure consistency - the sum of the distributions of age groups 101-120, 121-140, 141-160, 161-180, 181 and above equals the historical data for forests aged 101 and above.

We thus obtain a value of 0.50%, resulting in 31498 hectares.

Year 2012: The National Institute of Statistics and Romanian Government (2013) indicate a total forest land area in the National Forest Fund of 6364900 hectares.

Romanian Government (2013) indicates that 0.9% of this land was aged 181 and above in 2012. However, Romanian Government (2013) indicates National Forest Inventory (INCDS, 2012) as a source, whereas the National Forest Inventory shows very different data. It is yet unclear why the numbers differ. Until I receive answers to my queries, I must make two different reference modes, with two different assumptions regarding distributions. The data set B takes on the distribution by age group data from the National Forest Inventory, instead of the yearly reports on the state of Romanian forests. Furthermore, the National Forest Inventory does not disaggregate to the age groups 161-180 and 181 and above, instead having only 161 and above.

I therefore estimated this value based on the value for [forest area age 161 and above] from INCDS (2018), and the ratio between [forest area age 181 and above] and [forest area age 161 and above] from Romanian Government (2013).

We thus obtain 0.42%, resulting in an area of 26559 hectares.

Year 2018: The only available data is from the National Forest Inventory (INCDS, 2018). However, they use the international definition of the term forest, not the national one. Furthermore, the National Forest Inventory does not disaggregate to the age groups 161-180 and 181 and above, instead having only 161 and above. A few assumptions therefore had to be made:

Assumption 1: The total forest land area is equal to $[\text{Year 2017 value}]/[\text{Year 2016 value}] * [\text{Year 2017 value}]$ (linear extrapolation).

Thus we obtain 6405800

Assumption 2: The ratio between the [fraction of forests age 181 and above] from Romanian Government (2013) and [fraction of forests aged 161 and above] from INCDS (2012, 2018) remains the same in 2018 as it was in 2012.

I then estimated the area based on the value for [forest area age 161 and over] from INCDS (2018), and the ratio between [forest area age 181 and above] and [forest area age 161 and above] from Romanian Government (2013).

Thus we obtain 0.44%, resulting in 27947 hectares.

INCDS Marin Dracea. 2012. National Forest Inventory: Forest resources assessment in Romania, cycle I results. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

INCDS Marin Dracea. 2018. National Forest Inventory: Forest resources assessment in Romania, cycle II results. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

National Institute of Statistics. 2019. Silviculture dataset. <http://statistici.insse.ro:8077/tempo-online/#/pages/tables/inse-table>, accessed on 07.02.2019

Food and Agriculture Organization of the United Nations. 2010. Global Forest Resources Country Report Romania 2010.

Romanian Government. 2006. Raport privind starea padurilor în România 2005.

Romanian Government. 2013. Raport privind starea padurilor României 2012.

Notes:

Forest land area values disaggregated by age groups are not available before 2005. The 2005 value should be taken with a grain of salt, since the methodology by which this value was arrived to is not the same (or of the same quality) as the methodology used in the National Forest Inventory. The distribution from 2006 to 2011 indicated by the yearly reports on the state of the Romanian forests is identical with the 2005 distribution. Since this does not reflect reality, as the distribution changes with time, I have instead relied on interpolation. The same is true for the period 2013-2017, since the distributions indicated by the yearly reports on the state of the Romanian forests is identical with the 2012 distribution. Hence, here too I have relied on interpolation.

"Forest_area_age_21-40_A" = GRAPH(TIME)

(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 1184270.0), (2006.00, 1204281.6), (2007.00, 1225090.6), (2008.00, 1236544.4), (2009.00, 1254132.0), (2010.00, 1270740.0), (2011.00, 1285709.8), (2012.00, 1300051.2), (2013.00, 1267219.025), (2014.00,

1234090.163), (2015.00, 1201790.513), (2016.00, 1168290.501), (2017.00, 1133986.566), (2018.00, 1099667.571)

UNITS: Hectares

DOCUMENT: Sources:

Year 2005: The National Institute of Statistics, Romanian Government (2006), and FAO (2010), indicate a total forest land area in the National Forest Fund of 6233000 hectares.

Romanian Government (2006), indicates that 19% of this land was aged 21-40 in 2005, which results in an area of 1184270 hectares.

Year 2012: The National Institute of Statistics and Romanian Government (2013) indicate a total forest land area in the National Forest Fund of 6364900 hectares.

Romanian Government (2013) indicates that 20.4% of this land was aged 21-40 in 2012, which results in an area of 1300051.2 hectares.

However, Romanian Government (2013) indicates National Forest Inventory (INCDS, 2012) as a source, whereas the National Forest Inventory shows very different data. It is yet unclear why the numbers differ. Until I receive answers to my queries, I must make two different reference modes, with two different assumptions regarding distributions.

Year 2018: The only available data is from the National Forest Inventory (INCDS, 2018). However, they use the international definition of the term forest, not the national one. A few assumptions therefore had to be made:

Assumption 1: The total forest land area is equal to $[\text{Year 2017 value}]/[\text{Year 2016 value}] * [\text{Year 2017 value}]$ (linear extrapolation).

Thus we obtain 6405800

Assumption 2: The distribution of forest age groups, according to the national definition of forest land, changed proportionally to how the distribution of forests age groups changed, according to the international definition of forest land used by the National Forest Inventory.

Thus we obtain 17.16%.

The final result is 1099667.572 hectares.

INCDS Marin Dracea. 2012. National Forest Inventory: Forest resources assessment in Romania, cycle I results. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

INCDS Marin Dracea. 2018. National Forest Inventory: Forest resources assessment in Romania, cycle II results. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

National Institute of Statistics. 2019. Silviculture dataset. <http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table>, accessed on 07.02.2019

Food and Agriculture Organization of the United Nations. 2010. Global Forest Resources Country Report Romania 2010.

Romanian Government. 2006. Raport privind starea padurilor în România 2005.

Romanian Government. 2013. Raport privind starea padurilor României 2012.

Notes:

Forest land area values disaggregated by age groups are not available before 2005. The 2005 value should be taken with a grain of salt, since the methodology by which this value was arrived to is not the same (or of the same quality) as the methodology used in the National Forest Inventory. The distribution from 2006 to 2011 indicated by the yearly reports on the state of the Romanian forests is identical with the 2005 distribution. Since this does not reflect reality, as the distribution changes with time, I have instead relied on interpolation. The same is true for the period 2013-2017, since the distributions indicated by the yearly reports on the state of the Romanian forests is identical with the 2012 distribution. Hence, here too I have relied on interpolation.

"Forest_area_age_21-40_B" = GRAPH(TIME)

(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 1184270.0), (2006.00, 1210089.787), (2007.00, 1236785.871), (2008.00, 1254070.638), (2009.00, 1277593.282), (2010.00, 1300157.815), (2011.00, 1321073.407), (2012.00, 1341359.951), (2013.00, 1308439.832), (2014.00, 1275215.592), (2015.00, 1242851.088), (2016.00, 1209247.99), (2017.00, 1174813.945), (2018.00, 1140364.794)

UNITS: Hectares

DOCUMENT: Sources:

Year 2005: The National Institute of Statistics, Romanian Government (2006), and FAO (2010), indicate a total forest land area in the National Forest Fund of 6233000 hectares.

Romanian Government (2006), indicates that 19% of this land was aged 21-40 in 2005, which results in an area of 1184270 hectares.

Year 2012: The National Institute of Statistics and Romanian Government (2013) indicate a total forest land area in the National Forest Fund of 6364900 hectares.

Romanian Government (2013) indicates that 20.4% of this land was aged 21-40 in 2012. However, Romanian Government (2013) indicates National Forest Inventory (INCDS, 2012) as a source, whereas the National Forest Inventory shows very different data. It is yet unclear why the numbers differ. Until I receive answers to my queries, I must make two different reference modes, with two different assumptions regarding distributions. The data set B takes on the distribution by age group data from the National Forest Inventory, instead of the yearly reports on the state of Romanian forests.

The National Forest Inventory indicates 21.05%, thus resulting in 1341360 hectares.

Year 2018: The only available data is from the National Forest Inventory (INCDS, 2018). However, they use the international definition of the term forest, not the national one. A few assumptions therefore had to be made:

Assumption 1: The total forest land area is equal to [Year 2017 value]/[Year 2016 value]*[Year 2017 value] (linear extrapolation).

Thus we obtain 6405800

Assumption 2: In line with how the data for 2012 was obtained, I rely on the data from INCDS (2018).

Thus we obtain 17.8%, resulting in 1140364 hectares.

INCDS Marin Dracea. 2012. National Forest Inventory: Forest resources assessment in Romania, cycle I results. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

INCDS Marin Dracea. 2018. National Forest Inventory: Forest resources assessment in Romania, cycle II results. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

National Institute of Statistics. 2019. Silviculture dataset. <http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table>, accessed on 07.02.2019

Food and Agriculture Organization of the United Nations. 2010. Global Forest Resources Country Report Romania 2010.

Romanian Government. 2006. Raport privind starea padurilor în România 2005.

Romanian Government. 2013. Raport privind starea padurilor României 2012.

Notes:

Forest land area values disaggregated by age groups are not available before 2005. The 2005 value should be taken with a grain of salt, since the methodology by which this value was arrived to is not the same (or of the same quality) as the methodology used in the National Forest Inventory. The distribution from 2006 to 2011 indicated by the yearly reports on the state of the Romanian forests is identical with the 2005 distribution. Since this does not reflect reality, as the distribution changes with time, I have instead relied on interpolation. The same is true for the period 2013-2017, since the distributions indicated by the yearly reports on the state of the Romanian forests is identical with the 2012 distribution. Hence, here too I have relied on interpolation.

"Forest_area_age_41-60_A" = GRAPH(TIME)

(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 1121940.0), (2006.00, 1135286.3), (2007.00, 1149311.8), (2008.00, 1154528.7), (2009.00, 1165456.0), (2010.00, 1175434.5), (2011.00, 1183871.4), (2012.00, 1191713.6), (2013.00, 1213780.747), (2014.00, 1235685.474), (2015.00, 1258577.592), (2016.00, 1280364.471), (2017.00, 1301334.305), (2018.00, 1322313.239)

UNITS: Hectares

DOCUMENT: Sources:

Year 2005: The National Institute of Statistics, Romanian Government (2006), and FAO (2010), indicate a total forest land area in the National Forest Fund of 6233000 hectares.

Romanian Government (2006), indicates that 18% of this land was aged 41-60 in 2005, which results in an area of 1121940 hectares.

Year 2012: The National Institute of Statistics and Romanian Government (2013) indicate a total forest land area in the National Forest Fund of 6364900 hectares.

Romanian Government (2013) indicates that 18.7% of this land was aged 41-60 in 2012, which results in an area of 1191713.6 hectares.

However, Romanian Government (2013) indicates National Forest Inventory (INCDS, 2012) as a source, whereas the National Forest Inventory shows very different data. It is yet unclear why the

numbers differ. Until I receive answers to my queries, I must make two different reference modes, with two different assumptions regarding distributions.

Year 2018: The only available data is from the National Forest Inventory (INCDS, 2018). However, they use the international definition of the term forest, not the national one. A few assumptions therefore had to be made:

Assumption 1: The total forest land area is equal to [Year 2017 value]/[Year 2016 value]*[Year 2017 value] (linear extrapolation).

Thus we obtain 6405800

Assumption 2: The distribution of forest age groups, according to the national definition of forest land, changed proportionally to how the distribution of forests age groups changed, according to the international definition of forest land used by the National Forest Inventory.

Thus we obtain 20.64%.

The final result is 1322313.237 hectares.

INCDS Marin Dracea. 2012. National Forest Inventory: Forest resources assessment in Romania, cycle I results. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

INCDS Marin Dracea. 2018. National Forest Inventory: Forest resources assessment in Romania, cycle II results. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

National Institute of Statistics.2019. Silviculture dataset. <http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table>, accessed on 07.02.2019

Food and Agriculture Organization of the United Nations. 2010. Global Forest Resources Country Report Romania 2010.

Romanian Government. 2006. Raport privind starea padurilor în România 2005.

Romanian Government. 2013. Raport privind starea padurilor României 2012.

Notes:

Forest land area values disaggregated by age groups are not available before 2005. The 2005 value should be taken with a grain of salt, since the methodology by which this value was arrived to is not the same (or of the same quality) as the methodology used in the National Forest Inventory. The distribution from 2006 to 2011 indicated by the yearly reports on the state of the Romanian forests is identical with the 2005 distribution. Since this does not reflect reality, as the distribution changes with time, I have instead relied on interpolation. The same is true for the period 2013-2017, since the distributions indicated by the yearly reports on the state of the Romanian forests is identical with the 2012 distribution. Hence, here too I have relied on interpolation.

"Forest_area_age_41-60_B" = GRAPH(TIME)

(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 1121940.0), (2006.00, 1133066.652), (2007.00, 1144842.354), (2008.00, 1147830.9), (2009.00, 1156490.071), (2010.00, 1164192.231), (2011.00, 1170356.897), (2012.00, 1175927.11), (2013.00, 1198800.508), (2014.00, 1221515.952), (2015.00, 1245210.486), (2016.00, 1267814.326), (2017.00, 1289610.243), (2018.00, 1311415.629)

UNITS: Hectares

DOCUMENT: Sources:

Year 2005: The National Institute of Statistics, Romanian Government (2006), and FAO (2010), indicate a total forest land area in the National Forest Fund of 6233000 hectares.

Romanian Government (2006), indicates that 18% of this land was aged 41-60 in 2005, which results in an area of 1121940 hectares.

Year 2012: The National Institute of Statistics and Romanian Government (2013) indicate a total forest land area in the National Forest Fund of 6364900 hectares.

Romanian Government (2013) indicates that 18.7% of this land was aged 41-60 in 2012, However, Romanian Government (2013) indicates National Forest Inventory (INCDS, 2012) as a source, whereas the National Forest Inventory shows very different data. It is yet unclear why the numbers differ. Until I receive answers to my queries, I must make two different reference modes, with two different assumptions regarding distributions. The data set B takes on the distribution by age group data from the National Forest Inventory, instead of the yearly reports on the state of Romanian forests.

The National Forest Inventory indicates 18.45%, thus resulting in 1175927 hectares.

Year 2018: The only available data is from the National Forest Inventory (INCDS, 2018). However, they use the international definition of the term forest, not the national one. A few assumptions therefore had to be made:

Assumption 1: The total forest land area is equal to $[\text{Year 2017 value}]/[\text{Year 2016 value}] * [\text{Year 2017 value}]$ (linear extrapolation).

Thus we obtain 6405800

Assumption 2: In line with how the data for 2012 was obtained, I rely on the data from INCDS (2018).

Thus we obtain 20.47%, resulting in 1311415 hectares.

INCDS Marin Dracea. 2012. National Forest Inventory: Forest resources assessment in Romania, cycle I results. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

INCDS Marin Dracea. 2018. National Forest Inventory: Forest resources assessment in Romania, cycle II results. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

National Institute of Statistics. 2019. Silviculture dataset. <http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table>, accessed on 07.02.2019

Food and Agriculture Organization of the United Nations. 2010. Global Forest Resources Country Report Romania 2010.

Romanian Government. 2006. Raport privind starea padurilor în România 2005.

Romanian Government. 2013. Raport privind starea padurilor României 2012.

Notes:

Forest land area values disaggregated by age groups are not available before 2005. The 2005 value should be taken with a grain of salt, since the methodology by which this value was arrived to is not the

same (or of the same quality) as the methodology used in the National Forest Inventory. The distribution from 2006 to 2011 indicated by the yearly reports on the state of the Romanian forests is identical with the 2005 distribution. Since this does not reflect reality, as the distribution changes with time, I have instead relied on interpolation. The same is true for the period 2013-2017, since the distributions indicated by the yearly reports on the state of the Romanian forests is identical with the 2012 distribution. Hence, here too I have relied on interpolation.

"Forest_area_age_61-80_A" = GRAPH(TIME)

(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 934950.0), (2006.00, 975790.6741), (2007.00, 1017601.028), (2008.00, 1051783.759), (2009.00, 1091257.712), (2010.00, 1130050.929), (2011.00, 1167504.512), (2012.00, 1204459.2), (2013.00, 1212839.423), (2014.00, 1221026.25), (2015.00, 1230150.366), (2016.00, 1238158.739), (2017.00, 1245362.698), (2018.00, 1252569.748)

UNITS: Hectares

DOCUMENT: Sources:

Year 2005: The National Institute of Statistics, Romanian Government (2006), and FAO (2010), indicate a total forest land area in the National Forest Fund of 6233000 hectares.

Romanian Government (2006), indicates that 15% of this land was aged 61-80 in 2005, which results in an area of 934950 hectares.

Year 2012: The National Institute of Statistics and Romanian Government (2013) indicate a total forest land area in the National Forest Fund of 6364900 hectares.

Romanian Government (2013) indicates that 18.9% of this land was aged 61-80 in 2012, which results in an area of 1204459.2 hectares.

However, Romanian Government (2013) indicates National Forest Inventory (INCDS, 2012) as a source, whereas the National Forest Inventory shows very different data. It is yet unclear why the numbers differ. Until I receive answers to my queries, I must make two different reference modes, with two different assumptions regarding distributions.

Year 2018: The only available data is from the National Forest Inventory (INCDS, 2018). However, they use the international definition of the term forest, not the national one. A few assumptions therefore had to be made:

Assumption 1: The total forest land area is equal to [Year 2017 value]/[Year 2016 value]*[Year 2017 value] (linear extrapolation).

Thus we obtain 6405800

Assumption 2: The distribution of forest age groups, according to the national definition of forest land, changed proportionally to how the distribution of forests age groups changed, according to the international definition of forest land used by the National Forest Inventory.

Thus we obtain 19.55%.

The final result is 1252569.747 hectares.

INCDS Marin Dracea. 2012. National Forest Inventory: Forest resources assessment in Romania, cycle I results. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

INCDS Marin Dracea. 2018. National Forest Inventory: Forest resources assessment in Romania, cycle II results. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

National Institute of Statistics. 2019. Silviculture dataset. <http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table>, accessed on 07.02.2019

Food and Agriculture Organization of the United Nations. 2010. Global Forest Resources Country Report Romania 2010.

Romanian Government. 2006. Raport privind starea padurilor în România 2005.

Romanian Government. 2013. Raport privind starea padurilor României 2012.

Notes:

Forest land area values disaggregated by age groups are not available before 2005. The 2005 value should be taken with a grain of salt, since the methodology by which this value was arrived to is not the same (or of the same quality) as the methodology used in the National Forest Inventory. The distribution from 2006 to 2011 indicated by the yearly reports on the state of the Romanian forests is identical with the 2005 distribution. Since this does not reflect reality, as the distribution changes with time, I have instead relied on interpolation. The same is true for the period 2013-2017, since the distributions indicated by the yearly reports on the state of the Romanian forests is identical with the 2012 distribution. Hence, here too I have relied on interpolation.

"Forest_area_age_61-80_B" = GRAPH(TIME)

(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 934950.0), (2006.00, 973649.0349), (2007.00, 1013288.665), (2008.00, 1045321.357), (2009.00, 1082606.9), (2010.00, 1119203.772), (2011.00, 1154464.983), (2012.00, 1189227.532), (2013.00, 1198543.045), (2014.00, 1207669.793), (2015.00, 1217726.513), (2016.00, 1226681.497), (2017.00, 1234840.647), (2018.00, 1243003.305)

UNITS: Hectares

DOCUMENT: Sources:

Year 2005: The National Institute of Statistics, Romanian Government (2006), and FAO (2010), indicate a total forest land area in the National Forest Fund of 6233000 hectares.

Romanian Government (2006), indicates that 15% of this land was aged 61-80 in 2005, which results in an area of 934950 hectares.

Year 2012: The National Institute of Statistics and Romanian Government (2013) indicate a total forest land area in the National Forest Fund of 6364900 hectares.

Romanian Government (2013) indicates that 18.9% of this land was aged 61-80 in 2012. However, Romanian Government (2013) indicates National Forest Inventory (INCDS, 2012) as a source, whereas the National Forest Inventory shows very different data. It is yet unclear why the numbers differ. Until I receive answers to my queries, I must make two different reference modes, with two different assumptions regarding distributions. The data set B takes on the distribution by age group data from the National Forest Inventory, instead of the yearly reports on the state of Romanian forests.

The National Forest Inventory indicates 18.66%, thus resulting in 1189227 hectares.

Year 2018: The only available data is from the National Forest Inventory (INCDS, 2018). However, they use the international definition of the term forest, not the national one. A few assumptions therefore had to be made:

Assumption 1: The total forest land area is equal to $[\text{Year 2017 value}]/[\text{Year 2016 value}] * [\text{Year 2017 value}]$ (linear extrapolation).

Thus we obtain 6405800

Assumption 2: In line with how the data for 2012 was obtained, I rely on the data from INCDS (2018).

Thus we obtain 19.40%, resulting in 1243003 hectares.

INCDS Marin Dracea. 2012. National Forest Inventory: Forest resources assessment in Romania, cycle I results. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

INCDS Marin Dracea. 2018. National Forest Inventory: Forest resources assessment in Romania, cycle II results. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

National Institute of Statistics. 2019. Silviculture dataset. <http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table>, accessed on 07.02.2019

Food and Agriculture Organization of the United Nations. 2010. Global Forest Resources Country Report Romania 2010.

Romanian Government. 2006. Raport privind starea padurilor în România 2005.

Romanian Government. 2013. Raport privind starea padurilor României 2012.

Notes:

Forest land area values disaggregated by age groups are not available before 2005. The 2005 value should be taken with a grain of salt, since the methodology by which this value was arrived to is not the same (or of the same quality) as the methodology used in the National Forest Inventory. The distribution from 2006 to 2011 indicated by the yearly reports on the state of the Romanian forests is identical with the 2005 distribution. Since this does not reflect reality, as the distribution changes with time, I have instead relied on interpolation. The same is true for the period 2013-2017, since the distributions indicated by the yearly reports on the state of the Romanian forests is identical with the 2012 distribution. Hence, here too I have relied on interpolation.

"Forest_area_age_81-100_A" = GRAPH(TIME)

(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 623300.0), (2006.00, 668447.9741), (2007.00, 714485.8277), (2008.00, 755265.4589), (2009.00, 799893.7125), (2010.00, 844134.4295), (2011.00, 887448.9116), (2012.00, 930428.8), (2013.00, 926410.3333), (2014.00, 922220.4421), (2015.00, 918708.8746), (2016.00, 914336.392), (2017.00, 909358.6369), (2018.00, 904378.6554)

UNITS: Hectares

DOCUMENT: Sources:

Year 2005: The National Institute of Statistics, Romanian Government (2006), and FAO (2010), indicate a total forest land area in the National Forest Fund of 6233000 hectares.

Romanian Government (2006), indicates that 10% of this land was aged 81-100 in 2005, which results in an area of 623300 hectares.

Year 2012: The National Institute of Statistics and Romanian Government (2013) indicate a total forest land area in the National Forest Fund of 6364900 hectares.

Romanian Government (2013) indicates that 14.6% of this land was aged 81-100 in 2012, which results in an area of 930428.8 hectares.

However, Romanian Government (2013) indicates National Forest Inventory (INCDS, 2012) as a source, whereas the National Forest Inventory shows very different data. It is yet unclear why the numbers differ. Until I receive answers to my queries, I must make two different reference modes, with two different assumptions regarding distributions.

Year 2018: The only available data is from the National Forest Inventory (INCDS, 2018). However, they use the international definition of the term forest, not the national one. A few assumptions therefore had to be made:

Assumption 1: The total forest land area is equal to $[\text{Year 2017 value}]/[\text{Year 2016 value}] * [\text{Year 2017 value}]$ (linear extrapolation).

Thus we obtain 6405800

Assumption 2: The distribution of forest age groups, according to the national definition of forest land, changed proportionally to how the distribution of forests age groups changed, according to the international definition of forest land used by the National Forest Inventory.

Thus we obtain 14.12%.

The final result is 904378.7 hectares.

INCDS Marin Dracea. 2012. National Forest Inventory: Forest resources assessment in Romania, cycle I results. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

INCDS Marin Dracea. 2018. National Forest Inventory: Forest resources assessment in Romania, cycle II results. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

National Institute of Statistics. 2019. Silviculture dataset. <http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table>, accessed on 07.02.2019

Food and Agriculture Organization of the United Nations. 2010. Global Forest Resources Country Report Romania 2010.

Romanian Government. 2006. Raport privind starea padurilor în România 2005.

Romanian Government. 2013. Raport privind starea padurilor României 2012.

Notes:

Forest land area values disaggregated by age groups are not available before 2005. The 2005 value should be taken with a grain of salt, since the methodology by which this value was arrived to is not the same (or of the same quality) as the methodology used in the National Forest Inventory. The distribution from 2006 to 2011 indicated by the yearly reports on the state of the Romanian forests is identical with

the 2005 distribution. Since this does not reflect reality, as the distribution changes with time, I have instead relied on interpolation. The same is true for the period 2013-2017, since the distributions indicated by the yearly reports on the state of the Romanian forests is identical with the 2012 distribution. Hence, here too I have relied on interpolation.

"Forest_area_age_81-100_B" = GRAPH(TIME)

(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 623300.0), (2006.00, 665143.9084), (2007.00, 707832.8153), (2008.00, 745295.4223), (2009.00, 786547.4424), (2010.00, 827399.705), (2011.00, 867331.8495), (2012.00, 906929.7564), (2013.00, 903754.9921), (2014.00, 900414.6917), (2015.00, 897738.8168), (2016.00, 894223.7004), (2017.00, 890117.4522), (2018.00, 886009.3723)

UNITS: Hectares

DOCUMENT: Sources:

Year 2005: The National Institute of Statistics, Romanian Government (2006), and FAO (2010), indicate a total forest land area in the National Forest Fund of 6233000 hectares.

Romanian Government (2006), indicates that 10% of this land was aged 81-100 in 2005, which results in an area of 623300 hectares.

Year 2012: The National Institute of Statistics and Romanian Government (2013) indicate a total forest land area in the National Forest Fund of 6364900 hectares.

Romanian Government (2013) indicates that 14.6% of this land was aged 81-100 in 2012. However, Romanian Government (2013) indicates National Forest Inventory (INCDS, 2012) as a source, whereas the National Forest Inventory shows very different data. It is yet unclear why the numbers differ. Until I receive answers to my queries, I must make two different reference modes, with two different assumptions regarding distributions. The data set B takes on the distribution by age group data from the National Forest Inventory, instead of the yearly reports on the state of Romanian forests.

The National Forest Inventory indicates 14.23%, thus resulting in 906929 hectares.

Year 2018: The only available data is from the National Forest Inventory (INCDS, 2018). However, they use the international definition of the term forest, not the national one. A few assumptions therefore had to be made:

Assumption 1: The total forest land area is equal to [Year 2017 value]/[Year 2016 value]*[Year 2017 value] (linear extrapolation).

Thus we obtain 6405800

Assumption 2: In line with how the data for 2012 was obtained, I rely on the data from INCDS (2018).

Thus we obtain 13.83%, resulting in 886009 hectares.

INCDS Marin Dracea. 2012. National Forest Inventory: Forest resources assessment in Romania, cycle I results. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

INCDS Marin Dracea. 2018. National Forest Inventory: Forest resources assessment in Romania, cycle II results. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

National Institute of Statistics.2019. Silviculture dataset. <http://statistici.insse.ro:8077/tempo-online/#/pages/tables/inse-table>, accessed on 07.02.2019

Food and Agriculture Organization of the United Nations. 2010. Global Forest Resources Country Report Romania 2010.

Romanian Government. 2006. Raport privind starea padurilor în România 2005.

Romanian Government. 2013. Raport privind starea padurilor României 2012.

Notes:

Forest land area values disaggregated by age groups are not available before 2005. The 2005 value should be taken with a grain of salt, since the methodology by which this value was arrived to is not the same (or of the same quality) as the methodology used in the National Forest Inventory. The distribution from 2006 to 2011 indicated by the yearly reports on the state of the Romanian forests is identical with the 2005 distribution. Since this does not reflect reality, as the distribution changes with time, I have instead relied on interpolation. The same is true for the period 2013-2017, since the distributions indicated by the yearly reports on the state of the Romanian forests is identical with the 2012 distribution. Hence, here too I have relied on interpolation.

"Fraction_of_forest_age_1-20_A" = GRAPH(TIME)

(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 0.23), (2006.00, 0.213285714), (2007.00, 0.196571429), (2008.00, 0.179857143), (2009.00, 0.163142857), (2010.00, 0.146428571), (2011.00, 0.129714286), (2012.00, 0.113), (2013.00, 0.110198233), (2014.00, 0.107396467), (2015.00, 0.1045947), (2016.00, 0.101792933), (2017.00, 0.098991167), (2018.00, 0.0961894)

UNITS: dmnl

"Fraction_of_forest_age_1-20_B" = GRAPH(TIME)

(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 0.23), (2006.00, 0.215821979), (2007.00, 0.201643957), (2008.00, 0.187465936), (2009.00, 0.173287915), (2010.00, 0.159109894), (2011.00, 0.144931872), (2012.00, 0.130753851), (2013.00, 0.12760599), (2014.00, 0.124458129), (2015.00, 0.121310267), (2016.00, 0.118162406), (2017.00, 0.115014545), (2018.00, 0.111866684)

UNITS: dmnl

Fraction_of_forest_age_101_and_above_A = GRAPH(TIME)

(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 0.15), (2006.00, 0.151571429), (2007.00, 0.153142857), (2008.00, 0.154714286), (2009.00, 0.156285714), (2010.00, 0.157857143), (2011.00, 0.159428571), (2012.00, 0.161), (2013.00, 0.165692822), (2014.00, 0.170385643), (2015.00, 0.175078465), (2016.00, 0.179771287), (2017.00, 0.184464108), (2018.00, 0.18915693)

UNITS: dmnl

Fraction_of_forest_age_101_and_above_B = GRAPH(TIME)

(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 0.15), (2006.00, 0.149331254), (2007.00, 0.148662508), (2008.00, 0.147993762), (2009.00, 0.147325016), (2010.00, 0.14665627), (2011.00, 0.145987524), (2012.00, 0.145318778), (2013.00, 0.149963772), (2014.00, 0.154608766), (2015.00, 0.159253759), (2016.00, 0.163898753), (2017.00, 0.168543747), (2018.00, 0.173188741)

UNITS: dmnl

"Fraction_of_forest_age_101-120_A" = GRAPH(TIME)

(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 0.08433294), (2006.00, 0.08478606), (2007.00, 0.08521564), (2008.00, 0.085621363), (2009.00, 0.086002931), (2010.00, 0.086360063), (2011.00, 0.0866925), (2012.00, 0.087), (2013.00, 0.088958176), (2014.00, 0.090916353), (2015.00, 0.092874529), (2016.00, 0.094832705), (2017.00, 0.096790882), (2018.00, 0.098749058)

UNITS: dmn1

"Fraction_of_forest_age_101-120_B" = GRAPH(TIME)

(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 0.092686255), (2006.00, 0.091627207), (2007.00, 0.090562718), (2008.00, 0.08949312), (2009.00, 0.088418749), (2010.00, 0.087339948), (2011.00, 0.086257066), (2012.00, 0.085170456), (2013.00, 0.087169186), (2014.00, 0.089167916), (2015.00, 0.091166646), (2016.00, 0.093165376), (2017.00, 0.095164106), (2018.00, 0.097162836)

UNITS: dmn1

"Fraction_of_forest_age_121-140_A" = GRAPH(TIME)

(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 0.029326522), (2006.00, 0.030344237), (2007.00, 0.031387703), (2008.00, 0.032457182), (2009.00, 0.033552924), (2010.00, 0.034675164), (2011.00, 0.035824121), (2012.00, 0.037), (2013.00, 0.038936489), (2014.00, 0.040872979), (2015.00, 0.042809468), (2016.00, 0.044745958), (2017.00, 0.046682447), (2018.00, 0.048618937)

UNITS: dmn1

"Fraction_of_forest_age_121-140_B" = GRAPH(TIME)

(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 0.032157574), (2006.00, 0.032721386), (2007.00, 0.033288635), (2008.00, 0.033859105), (2009.00, 0.034432574), (2010.00, 0.03500881), (2011.00, 0.035587575), (2012.00, 0.036168623), (2013.00, 0.038101782), (2014.00, 0.040034941), (2015.00, 0.0419681), (2016.00, 0.043901259), (2017.00, 0.045834418), (2018.00, 0.047767577)

UNITS: dmn1

"Fraction_of_forest_age_141-160_A" = GRAPH(TIME)

(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 0.014748359), (2006.00, 0.015064483), (2007.00, 0.015382694), (2008.00, 0.015702852), (2009.00, 0.016024813), (2010.00, 0.016348428), (2011.00, 0.016673543), (2012.00, 0.017), (2013.00, 0.017660332), (2014.00, 0.018320663), (2015.00, 0.018980995), (2016.00, 0.019641326), (2017.00, 0.020301658), (2018.00, 0.02096199)

UNITS: dmn1

"Fraction_of_forest_age_141-160_B" = GRAPH(TIME)

(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 0.015968046), (2006.00, 0.01603882), (2007.00, 0.016106787), (2008.00, 0.016171885), (2009.00, 0.01623405), (2010.00, 0.016293222), (2011.00, 0.01634934), (2012.00, 0.016402349), (2013.00, 0.017056565), (2014.00, 0.017710782), (2015.00, 0.018364998), (2016.00, 0.019019215), (2017.00, 0.019673431), (2018.00, 0.020327648)

UNITS: dmn1

Fraction_of_forest_age_161_and_above_A = GRAPH(TIME)

(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 0.021592178), (2006.00, 0.021376647), (2007.00, 0.02115682), (2008.00, 0.020932888), (2009.00, 0.020705046), (2010.00, 0.020473488), (2011.00, 0.020238407), (2012.00, 0.02), (2013.00, 0.020137824), (2014.00, 0.020275649), (2015.00, 0.020413473), (2016.00, 0.020551297), (2017.00, 0.020689122), (2018.00, 0.020826946)

UNITS: dmn1

Fraction_of_forest_age_161_and_above_B = GRAPH(TIME)
(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 0.009188125),
(2006.00, 0.008943842), (2007.00, 0.008704368), (2008.00, 0.008469652), (2009.00, 0.008239643),
(2010.00, 0.00801429), (2011.00, 0.007793543), (2012.00, 0.00757735), (2013.00, 0.00736238),
(2014.00, 0.007147126), (2015.00, 0.006931951), (2016.00, 0.006716776), (2017.00, 0.006501601),
(2018.00, 0.006286426)

UNITS: dmn1

"Fraction_of_forest_age_161-180_A" = GRAPH(TIME)
(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 0.00971648),
(2006.00, 0.009619491), (2007.00, 0.009520569), (2008.00, 0.0094198), (2009.00, 0.009317271),
(2010.00, 0.009213069), (2011.00, 0.009107283), (2012.00, 0.009), (2013.00, 0.0090062021), (2014.00,
0.0089124042), (2015.00, 0.0088186063), (2016.00, 0.0087248084), (2017.00, 0.0086310105), (2018.00,
0.0085372126)

UNITS: dmn1

"Fraction_of_forest_age_161-180_B" = GRAPH(TIME)
(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 0.004134656),
(2006.00, 0.004024729), (2007.00, 0.003916966), (2008.00, 0.003811343), (2009.00, 0.003707839),
(2010.00, 0.003606431), (2011.00, 0.003507094), (2012.00, 0.003409807), (2013.00, 0.0033136307),
(2014.00, 0.003218463), (2015.00, 0.003123296), (2016.00, 0.003028129), (2017.00, 0.002932962),
(2018.00, 0.002837795)

UNITS: dmn1

Fraction_of_forest_age_181_and_above_A = GRAPH(TIME)
(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 0.011875698),
(2006.00, 0.011757156), (2007.00, 0.011636251), (2008.00, 0.011513088), (2009.00, 0.011387775),
(2010.00, 0.011260418), (2011.00, 0.011131124), (2012.00, 0.011), (2013.00, 0.011075803), (2014.00,
0.0111151607), (2015.00, 0.01122741), (2016.00, 0.011303214), (2017.00, 0.011379017), (2018.00,
0.01145482)

UNITS: dmn1

Fraction_of_forest_age_181_and_above_B = GRAPH(TIME)
(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 0.005053469),
(2006.00, 0.004919113), (2007.00, 0.004787402), (2008.00, 0.004658309), (2009.00, 0.004531804),
(2010.00, 0.00440786), (2011.00, 0.004286449), (2012.00, 0.004167542), (2013.00, 0.004199931),
(2014.00, 0.00423232), (2015.00, 0.004264708), (2016.00, 0.004297097), (2017.00, 0.004329485),
(2018.00, 0.004361874)

UNITS: dmn1

"Fraction_of_forest_age_21-40_A" = GRAPH(TIME)
(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 0.19), (2006.00,
0.192), (2007.00, 0.194), (2008.00, 0.196), (2009.00, 0.198), (2010.00, 0.2), (2011.00, 0.202), (2012.00,
0.204), (2013.00, 0.198604994), (2014.00, 0.193209989), (2015.00, 0.187814983), (2016.00,
0.182419977), (2017.00, 0.177024972), (2018.00, 0.171629966)

UNITS: dmn1

"Fraction_of_forest_age_21-40_B" = GRAPH(TIME)
(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 0.19), (2006.00,
0.192926006), (2007.00, 0.195852012), (2008.00, 0.198778018), (2009.00, 0.201704023), (2010.00,
0.204630029), (2011.00, 0.207556035), (2012.00, 0.210482041), (2013.00, 0.205065328), (2014.00,
0.199648614), (2015.00, 0.194231901), (2016.00, 0.188815188), (2017.00, 0.183398474), (2018.00,
0.177981761)

UNITS: dmn1

"Fraction_of_forest_age_41-60_A" = GRAPH(TIME)
(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 0.18), (2006.00, 0.181), (2007.00, 0.182), (2008.00, 0.183), (2009.00, 0.184), (2010.00, 0.185), (2011.00, 0.186), (2012.00, 0.187), (2013.00, 0.190229876), (2014.00, 0.193459752), (2015.00, 0.196689628), (2016.00, 0.199919504), (2017.00, 0.203149381), (2018.00, 0.206379257)

UNITS: dmnl

"Fraction_of_forest_age_41-60_B" = GRAPH(TIME)
(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 0.18), (2006.00, 0.180646119), (2007.00, 0.181292238), (2008.00, 0.181938357), (2009.00, 0.182584476), (2010.00, 0.183230595), (2011.00, 0.183876714), (2012.00, 0.184522833), (2013.00, 0.187882097), (2014.00, 0.191241362), (2015.00, 0.194600626), (2016.00, 0.197959891), (2017.00, 0.201319155), (2018.00, 0.204678419)

UNITS: dmnl

"Fraction_of_forest_age_61-80_A" = GRAPH(TIME)
(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 0.15), (2006.00, 0.155571429), (2007.00, 0.161142857), (2008.00, 0.166714286), (2009.00, 0.172285714), (2010.00, 0.177857143), (2011.00, 0.183428571), (2012.00, 0.189), (2013.00, 0.190082347), (2014.00, 0.191164694), (2015.00, 0.192247041), (2016.00, 0.193329389), (2017.00, 0.194411736), (2018.00, 0.195494083)

UNITS: dmnl

"Fraction_of_forest_age_61-80_B" = GRAPH(TIME)
(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 0.15), (2006.00, 0.155229985), (2007.00, 0.16045997), (2008.00, 0.165689955), (2009.00, 0.17091994), (2010.00, 0.176149924), (2011.00, 0.181379909), (2012.00, 0.186609894), (2013.00, 0.187841746), (2014.00, 0.189073598), (2015.00, 0.19030545), (2016.00, 0.191537302), (2017.00, 0.192769154), (2018.00, 0.194001006)

UNITS: dmnl

"Fraction_of_forest_age_81-100_A" = GRAPH(TIME)
(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 0.1), (2006.00, 0.106571429), (2007.00, 0.113142857), (2008.00, 0.119714286), (2009.00, 0.126285714), (2010.00, 0.132857143), (2011.00, 0.139428571), (2012.00, 0.146), (2013.00, 0.145191727), (2014.00, 0.144383455), (2015.00, 0.143575182), (2016.00, 0.142766909), (2017.00, 0.141958637), (2018.00, 0.141150364)

UNITS: dmnl

"Fraction_of_forest_age_81-100_B" = GRAPH(TIME)
(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 0.1), (2006.00, 0.106044658), (2007.00, 0.112089315), (2008.00, 0.118133973), (2009.00, 0.12417863), (2010.00, 0.130223288), (2011.00, 0.136267946), (2012.00, 0.142312603), (2013.00, 0.141641067), (2014.00, 0.140969532), (2015.00, 0.140297996), (2016.00, 0.13962646), (2017.00, 0.138954924), (2018.00, 0.138283389)

UNITS: dmnl

Total_forest_area = GRAPH(TIME)
(2000.00, 6223100.0), (2001.00, 6225100.0), (2002.00, 6239500.0), (2003.00, 6221300.0), (2004.00, 6222500.0), (2005.00, 6233000.0), (2006.00, 6272300.0), (2007.00, 6314900.0), (2008.00, 6308900.0), (2009.00, 6334000.0), (2010.00, 6353700.0), (2011.00, 6364900.0), (2012.00, 6372800.0), (2013.00, 6380600.0), (2014.00, 6387300.0), (2015.00, 6398800.0), (2016.00, 6404400.0), (2017.00, 6405800.0), (2018.00, 6407200.306)

UNITS: Hectares

DOCUMENT: Definition:

Only considering forests corresponding to Romanian definition by law (Forestry Code, Law 46 from 19.03.2008):

"Areas of at least 0.25 hectares that are covered with trees are considered forests and are included in the National Forest Fund; the trees must reach a minimum height of 5 meters at maturity under normal vegetation conditions.

The term forest includes:

a) forests included in forest management plans on the 1st of January 1990, as well as those included at a later date in forest management plans, according to the law.

b) forest belts;

c) thickets of dwarf mountain pine;

d) forested pastures with a stand density equal to or greater than 0.4, calculated exclusively at the level of terrain effectively covered with forestry vegetation."

Sources:

The main source used is the online database of the National Institute of Statistics. The data has been cross-checked with those from all the sources listed below.

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National Institute of Statistics.2019. Silviculture dataset. <http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table>, accessed on 07.02.2019.

Romanian Government. 2006. Raport privind starea padurilor în România 2005. http://www.mmediu.ro/app/webroot/uploads/files/2016-12-16_Raport_Starea_padurilor_2005.pdf, accessed on 18.02.2019.

Romanian Government. 2007. Raport privind starea padurilor în România 2006. http://www.mmediu.ro/app/webroot/uploads/files/2016-12-16_Raport_Starea_padurilor_2006.pdf, accessed on 18.02.2019.

Romanian Government. 2008. Raport privind starea padurilor în România 2007.
http://www.mmediu.ro/app/webroot/uploads/files/2016-12-16_Raport_Starea_padurilor_2007.pdf,
accessed on 18.02.2019.

Romanian Government. 2009. Raport privind starea padurilor în România 2008.
http://www.mmediu.ro/app/webroot/uploads/files/2016-12-16_Raport_Starea_padurilor_2008.pdf,
accessed on 18.02.2019.

Romanian Government. 2010. Raport privind starea padurilor în România 2009.
http://www.mmediu.ro/app/webroot/uploads/files/2016-12-16_Raport_Starea_padurilor_2009.pdf,
accessed on 18.02.2019.

Romanian Government. 2011. Raport privind starea padurilor în România 2010.
http://www.mmediu.ro/app/webroot/uploads/files/2016-12-16_Raport_Starea_padurilor_2010.pdf,
accessed on 18.02.2019.

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http://www.mmediu.ro/app/webroot/uploads/files/2016-12-16_Raport_Starea_padurilor_2011.pdf,
accessed on 18.02.2019.

Romanian Government. 2013. Raport privind starea padurilor României 2012.
http://www.mmediu.ro/app/webroot/uploads/files/2016-12-16_Raport_Starea_padurilor_2012.pdf,
accessed on 18.02.2019.

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http://www.mmediu.ro/app/webroot/uploads/files/2016-12-16_Raport_Starea_padurilor_2013.pdf,
accessed on 18.02.2019.

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http://www.mmediu.ro/app/webroot/uploads/files/2016-12-16_Raport_Starea_padurilor_2014.pdf,
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http://www.mmediu.ro/app/webroot/uploads/files/2016-12-16_Raport_Starea_padurilor_2015.pdf,
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<http://aepaduri.gov.ro/wp-content/uploads/2014/07/Raport-starea-padurilor-2016.pdf>, accessed on
18.02.2019.

Romanian Government. 2018. Raport privind starea padurilor României 2017.
<http://aepaduri.gov.ro/wp-content/uploads/2014/07/Starea-padurilor-in-anul-2017.pdf>, accessed on
18.02.2019.

Notes:

Data for forest land area (according to the national definition given above) is missing for the year
2018. I have estimated this value by ways of linear interpolation.

Virgin_forest_area = GRAPH(TIME)

(2000.00, 0.0), (2001.00, 0.0), (2002.00, 0.0), (2003.00, 0.0), (2004.00, 0.0), (2005.00, 218500.0),
(2006.00, 0.0), (2007.00, 0.0), (2008.00, 0.0), (2009.00, 0.0), (2010.00, 0.0), (2011.00, 0.0), (2012.00,
126880.0), (2013.00, 0.0), (2014.00, 0.0), (2015.00, 0.0), (2016.00, 0.0), (2017.00, 0.0), (2018.00,
29209.492)

UNITS: Hectares

"Volume_of_wood_in_forest_age_1-20_A" = "Forest_area_age_1-20_A"*"Density_of_forest_age_1-20"

UNITS: Cubic Meter

DOCUMENT: Definition:

Total volume of wood to be found in all forests belonging to the age group 1-20.

Calculated based on forest age distribution A.

"Volume_of_wood_in_forest_age_1-20_B" = "Density_of_forest_age_1-20"*"Forest_area_age_1-20_B"

UNITS: Cubic Meter

DOCUMENT: Definition:

Total volume of wood to be found in all forests belonging to the age group 1-20.

Calculated based on forest age distribution B.

"Volume_of_wood_in_forest_age_101-120_A" = "Density_of_forest_age_101-120"*"Forest_area_age_101-120_A"

UNITS: Cubic Meter

DOCUMENT: Definition:

Total volume of wood to be found in all forests belonging to the age group 101-120.

Calculated based on forest age distribution A.

"Volume_of_wood_in_forest_age_101-120_B" = "Density_of_forest_age_101-120"*"Forest_area_age_101-120_B"

UNITS: Cubic Meter

DOCUMENT: Definition:

Total volume of wood to be found in all forests belonging to the age group 101-120.

Calculated based on forest age distribution B.

"Volume_of_wood_in_forest_age_121-140_A" = "Density_of_forest_age_121-140"*"Forest_area_age_121-140_A"

UNITS: Cubic Meter

DOCUMENT: Definition:

Total volume of wood to be found in all forests belonging to the age group 121-140.

Calculated based on forest age distribution A.

"Volume_of_wood_in_forest_age_121-140_B" = "Density_of_forest_age_121-140"*"Forest_area_age_121-140_B"

UNITS: Cubic Meter

DOCUMENT: Definition:

Total volume of wood to be found in all forests belonging to the age group 121-140.

Calculated based on forest age distribution B.

"Volume_of_wood_in_forest_age_141-160_A" = "Density_of_forest_age_141-160"*"Forest_area_age_141-160_A"

UNITS: Cubic Meter

DOCUMENT: Definition:

Total volume of wood to be found in all forests belonging to the age group 141-160.

Calculated based on forest age distribution A.

"Volume_of_wood_in_forest_age_141-160_B" = "Density_of_forest_age_141-160"*"Forest_area_age_141-160_B"

UNITS: Cubic Meter

DOCUMENT: Definition:

Total volume of wood to be found in all forests belonging to the age group 141-160.

Calculated based on forest age distribution B.

"Volume_of_wood_in_forest_age_161-180_A" = "Density_of_forest_age_161-180"*"Forest_area_age_161-180_A"

UNITS: Cubic Meter

DOCUMENT: Definition:

Total volume of wood to be found in all forests belonging to the age group 161-180.

Calculated based on forest age distribution A.

"Volume_of_wood_in_forest_age_161-180_B" = "Density_of_forest_age_161-180"*"Forest_area_age_161-180_B"

UNITS: Cubic Meter

DOCUMENT: Definition:

Total volume of wood to be found in all forests belonging to the age group 161-180.

Calculated based on forest age distribution B.

Volume_of_wood_in_forest_age_181_and_above_A =

Density_of_forest_age_181_and_above*Forest_area_age_181_and_above_A

UNITS: Cubic Meter

DOCUMENT: Definition:

Total volume of wood to be found in all forests belonging to the age group 181 and above.

Calculated based on forest age distribution A.

Volume_of_wood_in_forest_age_181_and_above_B =

Density_of_forest_age_181_and_above*Forest_area_age_181_and_above_B

UNITS: Cubic Meter

DOCUMENT: Definition:

Total volume of wood to be found in all forests belonging to the age group 181 and above.

Calculated based on forest age distribution B.

"Volume_of_wood_in_forest_age_21-40_A" = "Density_of_forest_age_21-40"*"Forest_area_age_21-40_A"

UNITS: Cubic Meter

DOCUMENT: Definition:

Total volume of wood to be found in all forests belonging to the age group 21-40.

Calculated based on forest age distribution A.

"Volume_of_wood_in_forest_age_21-40_B" = "Density_of_forest_age_21-40"*"Forest_area_age_21-40_B"

UNITS: Cubic Meter

DOCUMENT: Definition:

Total volume of wood to be found in all forests belonging to the age group 21-40.

Calculated based on forest age distribution B.

"Volume_of_wood_in_forest_age_41-60_A" = "Density_of_forest_age_41-60"*"Forest_area_age_41-60_A"

UNITS: Cubic Meter

DOCUMENT: Definition:

Total volume of wood to be found in all forests belonging to the age group 41-60.

Calculated based on forest age distribution A.

"Volume_of_wood_in_forest_age_41-60_B" = "Density_of_forest_age_41-60"*"Forest_area_age_41-60_B"

UNITS: Cubic Meter

DOCUMENT: Definition:

Total volume of wood to be found in all forests belonging to the age group 41-60.

Calculated based on forest age distribution B.

"Volume_of_wood_in_forest_age_61-80_A" = "Density_of_forest_age_61-80"*"Forest_area_age_61-80_A"

UNITS: Cubic Meter

DOCUMENT: Definition:

Total volume of wood to be found in all forests belonging to the age group 61-80.

Calculated based on forest age distribution A.

"Volume_of_wood_in_forest_age_61-80_B" = "Density_of_forest_age_61-80"*"Forest_area_age_61-80_B"

UNITS: Cubic Meter

DOCUMENT: Definition:

Total volume of wood to be found in all forests belonging to the age group 61-80.

Calculated based on forest age distribution B.

"Volume_of_wood_in_forest_age_81-100_A" = "Density_of_forest_age_81-100"*"Forest_area_age_81-100_A"

UNITS: Cubic Meter

DOCUMENT: Definition:

Total volume of wood to be found in all forests belonging to the age group 81-100.

Calculated based on forest age distribution A.

"Volume_of_wood_in_forest_age_81-100_B" = "Density_of_forest_age_81-100"*"Forest_area_age_81-100_B"

UNITS: Cubic Meter

DOCUMENT: Definition:

Total volume of wood to be found in all forests belonging to the age group 81-100.

Calculated based on forest age distribution B.

Model:

Forest_area_age_1_to_20(t) = Forest_area_age_1_to_20(t - dt) + (Growth_of_forested_areas + Total_regeneration - "Aging_of_forest_1-20" - Forests_1_to_20_regenerating) * dt {CONVEYOR}

INIT Forest_area_age_1_to_20 = HISTORY(IF Dataset_version=0 THEN "MOE_Forest_area_1-20"*Hist."Forest_area_age_1-20_A" ELSE "MOE_Forest_area_1-20"*Hist."Forest_area_age_1-20_B", Initial_year)

TRANSIT TIME = 20

CAPACITY = INF

INFLOW LIMIT = INF

UNITS: Hectares

DOCUMENT: The initial value is determined by both the choice of dataset and the initial year from which the value is taken. This should be matched to the initial year of the simulation run.

INFLOWS:

Growth_of_forested_areas = IF TIME>=2018 THEN Hist.Average_afforestation ELSE
Hist.Afforestation {UNIFLOW}

UNITS: Hectare/Year

DOCUMENT: All other forest area growth, be it due to afforestation or the natural spread of forests. For 2012-2018 historical data has been used. Beyond 2018, the assumption is that the forest area will continue growing with the average growth rate since 1990.

Total_regeneration = Total_forest_area_regenerating {UNIFLOW}

UNITS: Hectare/Year

DOCUMENT: SUM of all forest area regeneration.

OUTFLOWS:

"Aging_of_forest_1-20" = CONVEYOR OUTFLOW

UNITS: Hectare/Year

DOCUMENT: Value determined by the value contained in slat [1] of the preceding conveyor stock.

Forests_1_to_20_regenerating = LEAKAGE OUTFLOW

LEAKAGE FRACTION = SAFEDIV(("Extraction_of_wood_from_forest_age_1-20"/Average_density_of_forest_age_1_to_20)*Fraction_of_forest_area_undergoing_complete_regeneration, Forest_area_age_1_to_20/Unit_of_measure_of_transit_time, 0)

UNITS: Hectare/Year

DOCUMENT: SAFEDIV is used to ensure model run continuation in situations where there is a forest depletion.

'Extraction of wood' / 'Average density' * 'Fraction of forest area...' is used to determine the absolute amount of forest area regeneration.

The division with 'forest area' / 'transit time' is there to determine the relative amount, as leakage outflows from conveyor stocks require fractional values, not absolute values.

Forest_area_age_101_to_120(t) = Forest_area_age_101_to_120(t - dt) + ("Aging_of_forest_81-100" - "Aging_of_forest_101-120" - Forests_101_to_120_regenerating) * dt {CONVEYOR}

INIT Forest_area_age_101_to_120 = HISTORY(IF Dataset_version=0 THEN "MOE_Forest_area_101-120"*Hist."Forest_area_age_101-120_A" ELSE "MOE_Forest_area_101-120"*Hist."Forest_area_age_101-120_B", Initial_year)

TRANSIT TIME = 20

UNITS: Hectares

DOCUMENT: The initial value is determined by both the choice of dataset and the initial year from which the value is taken. This should be matched to the initial year of the simulation run.

INFLOWS:

"Aging_of_forest_81-100" = CONVEYOR OUTFLOW

UNITS: Hectare/Year

DOCUMENT: Value determined by the value contained in slat [1] of the preceding conveyor stock.

OUTFLOWS:

"Aging_of_forest_101-120" = CONVEYOR OUTFLOW

UNITS: Hectare/Year

DOCUMENT: Value determined by the value contained in slat [1] of the preceding conveyor stock.

Forests_101_to_120_regenerating = LEAKAGE OUTFLOW

LEAKAGE FRACTION = SAFEDIV(("Extraction_of_wood_from_forest_age_101-120"/Average_density_of_forest_age_101_to_120)*Fraction_of_forest_area_undergoing_complete_regeneration, Forest_area_age_101_to_120/Unit_of_measure_of_transit_time, 0)

UNITS: Hectare/Year

DOCUMENT: SAFEDIV is used to ensure model run continuation in situations where there is a forest depletion.

'Extraction of wood' / 'Average density' * 'Fraction of forest area...' is used to determine the absolute amount of forest area regeneration.

The division with 'forest area' / 'transit time' is there to determine the relative amount, as leakage outflows from conveyor stocks require fractional values, not absolute values.

Forest_area_age_121_to_140(t) = Forest_area_age_121_to_140(t - dt) + ("Aging_of_forest_101-120" - "Aging_of_forest_121-140" - Forests_121_to_140_regenerating) * dt {CONVEYOR}

INIT Forest_area_age_121_to_140 = HISTORY(IF Dataset_version=0 THEN "MOE_Forest_area_121-140"*Hist."Forest_area_age_121-140_A" ELSE "MOE_Forest_area_121-140"*Hist."Forest_area_age_121-140_B", Initial_year)

TRANSIT TIME = 20

UNITS: Hectares

DOCUMENT: The initial value is determined by both the choice of dataset and the initial year from which the value is taken. This should be matched to the initial year of the simulation run.

INFLOWS:

"Aging_of_forest_101-120" = CONVEYOR OUTFLOW

UNITS: Hectare/Year

DOCUMENT: Value determined by the value contained in slat [1] of the preceding conveyor stock.

OUTFLOWS:

"Aging_of_forest_121-140" = CONVEYOR OUTFLOW

UNITS: Hectare/Year

DOCUMENT: Value determined by the value contained in slat [1] of the preceding conveyor stock.

Forests_121_to_140_regenerating = LEAKAGE OUTFLOW

LEAKAGE FRACTION = SAFEDIV(("Extraction_of_wood_from_forest_age_121-140"/Average_density_of_forest_age_121_to_140)*Fraction_of_forest_area_undergoing_complete_regeneration, Forest_area_age_121_to_140/Unit_of_measure_of_transit_time, 0)

UNITS: Hectare/Year

DOCUMENT: SAFEDIV is used to ensure model run continuation in situations where there is a forest depletion.

'Extraction of wood' / 'Average density' * 'Fraction of forest area...' is used to determine the absolute amount of forest area regeneration.

The division with 'forest area' / 'transit time' is there to determine the relative amount, as leakage outflows from conveyor stocks require fractional values, not absolute values.

Forest_area_age_141_to_160(t) = Forest_area_age_141_to_160(t - dt) + ("Aging_of_forest_121-140" - "Aging_of_forest_141-160" - Forests_141_to_160_regenerating) * dt {CONVEYOR}

INIT Forest_area_age_141_to_160 = HISTORY(IF Dataset_version=0 THEN "MOE_Forest_area_141-160"*Hist."Forest_area_age_141-160_A" ELSE "MOE_Forest_area_141-160"*Hist."Forest_area_age_141-160_B", Initial_year)

TRANSIT TIME = 20

UNITS: Hectares

DOCUMENT: The initial value is determined by both the choice of dataset and the initial year from which the value is taken. This should be matched to the initial year of the simulation run.

INFLOWS:

"Aging_of_forest_121-140" = CONVEYOR OUTFLOW

UNITS: Hectare/Year

DOCUMENT: Value determined by the value contained in slat [1] of the preceding conveyor stock.

OUTFLOWS:

"Aging_of_forest_141-160" = CONVEYOR OUTFLOW

UNITS: Hectare/Year

DOCUMENT: Value determined by the value contained in slat [1] of the preceding conveyor stock.

Forests_141_to_160_regenerating = LEAKAGE OUTFLOW

LEAKAGE FRACTION = SAFEDIV(("Extraction_of_wood_from_forest_age_141-160"/Average_density_of_forest_age_141_to_160)*Fraction_of_forest_area_undergoing_complete_regeneration, Forest_area_age_141_to_160/Unit_of_measure_of_transit_time, 0)

UNITS: Hectare/Year

DOCUMENT: SAFEDIV is used to ensure model run continuation in situations where there is a forest depletion.

'Extraction of wood' / 'Average density' * 'Fraction of forest area...' is used to determine the absolute amount of forest area regeneration.

The division with 'forest area' / 'transit time' is there to determine the relative amount, as leakage outflows from conveyor stocks require fractional values, not absolute values.

Forest_area_age_161_to_180(t) = Forest_area_age_161_to_180(t - dt) + ("Aging_of_forest_141-160" - "Aging_of_forest_161-180" - Forests_161_to_180_regenerating) * dt {CONVEYOR}

INIT Forest_area_age_161_to_180 = HISTORY(IF Dataset_version=0 THEN "MOE_Forest_area_161-180"*Hist."Forest_area_age_161-180_A" ELSE "MOE_Forest_area_161-180"*Hist."Forest_area_age_161-180_B", Initial_year)

TRANSIT TIME = 20

UNITS: Hectares

DOCUMENT: The initial value is determined by both the choice of dataset and the initial year from which the value is taken. This should be matched to the initial year of the simulation run.

INFLOWS:

"Aging_of_forest_141-160" = CONVEYOR OUTFLOW

UNITS: Hectare/Year

DOCUMENT: Value determined by the value contained in slat [1] of the preceding conveyor stock.

OUTFLOWS:

"Aging_of_forest_161-180" = CONVEYOR OUTFLOW

UNITS: Hectare/Year

DOCUMENT: Value determined by the value contained in slat [1] of the preceding conveyor stock.

Forests_161_to_180_regenerating = LEAKAGE OUTFLOW

LEAKAGE FRACTION = SAFEDIV(("Extraction_of_wood_from_forest_age_161-180"/Average_density_of_forest_age_161_to_180)*Fraction_of_forest_area_undergoing_complete_regeneration, Forest_area_age_161_to_180/Unit_of_measure_of_transit_time, 0)

UNITS: Hectare/Year

DOCUMENT: SAFEDIV is used to ensure model run continuation in situations where there is a forest depletion.

'Extraction of wood' / 'Average density' * 'Fraction of forest area...' is used to determine the absolute amount of forest area regeneration.

The division with 'forest area' / 'transit time' is there to determine the relative amount, as leakage outflows from conveyor stocks require fractional values, not absolute values.

Forest_area_age_181_and_above(t) = Forest_area_age_181_and_above(t - dt) + ("Aging_of_forest_161-180" - Forests_181_and_above_regenerating) * dt

INIT Forest_area_age_181_and_above = HISTORY(IF Dataset_version=0 THEN MOE_Forest_area_181_and_above*Hist.Forest_area_age_181_and_above_A ELSE MOE_Forest_area_181_and_above*Hist.Forest_area_age_181_and_above_B, Initial_year)

UNITS: Hectares

DOCUMENT: The initial value is determined by both the choice of dataset and the initial year from which the value is taken. This should be matched to the initial year of the simulation run.

INFLOWS:

"Aging_of_forest_161-180" = CONVEYOR OUTFLOW

UNITS: Hectare/Year

DOCUMENT: Value determined by the value contained in slat [1] of the preceding conveyor stock.

OUTFLOWS:

Forests_181_and_above_regenerating = SAFEDIV(Extraction_of_wood_from_forest_age_181_and_above, Average_density_of_forest_age_181_and_above, 0)*Fraction_of_forest_area_undergoing_complete_regeneration {UNIFLOW}

UNITS: Hectare/Year

DOCUMENT: SAFEDIV is used to ensure model run continuation in situations where there is a forest depletion.

'Extraction of wood' / 'Average density' * 'Fraction of forest area...' is used to determine the absolute amount of forest area regeneration.

Forest_area_age_21_to_40(t) = Forest_area_age_21_to_40(t - dt) + ("Aging_of_forest_1-20" - "Aging_of_forest_21-40" - Forests_21_to_40_regenerating) * dt {CONVEYOR}

INIT Forest_area_age_21_to_40 = HISTORY(IF Dataset_version=0 THEN "MOE_Forest_area_21-40"*Hist."Forest_area_age_21-40_A" ELSE "MOE_Forest_area_21-40"*Hist."Forest_area_age_21-40_B", Initial_year)

TRANSIT TIME = 20

UNITS: Hectares

DOCUMENT: The initial value is determined by both the choice of dataset and the initial year from which the value is taken. This should be matched to the initial year of the simulation run.

INFLOWS:

"Aging_of_forest_1-20" = CONVEYOR OUTFLOW

UNITS: Hectare/Year

DOCUMENT: Value determined by the value contained in slat [1] of the preceding conveyor stock.

OUTFLOWS:

"Aging_of_forest_21-40" = CONVEYOR OUTFLOW

UNITS: Hectare/Year

DOCUMENT: Value determined by the value contained in slat [1] of the preceding conveyor stock.

Forests_21_to_40_regenerating = LEAKAGE OUTFLOW

LEAKAGE FRACTION = SAFEDIV(("Extraction_of_wood_from_forest_age_21-40"/Average_density_of_forest_age_21_to_40)*Fraction_of_forest_area_undergoing_complete_regeneration, Forest_area_age_21_to_40/Unit_of_measure_of_transit_time, 0)

UNITS: Hectare/Year

DOCUMENT: SAFEDIV is used to ensure model run continuation in situations where there is a forest depletion.

'Extraction of wood' / 'Average density' * 'Fraction of forest area...' is used to determine the absolute amount of forest area regeneration.

The division with 'forest area' / 'transit time' is there to determine the relative amount, as leakage outflows from conveyor stocks require fractional values, not absolute values.

Forest_area_age_41_to_60(t) = Forest_area_age_41_to_60(t - dt) + ("Aging_of_forest_21-40" - "Aging_of_forest_41-60" - Forests_41_to_60_regenerating) * dt {CONVEYOR}

INIT Forest_area_age_41_to_60 = HISTORY(IF Dataset_version=0 THEN "MOE_Forest_area_41-60"*Hist."Forest_area_age_41-60_A" ELSE "MOE_Forest_area_41-60"*Hist."Forest_area_age_41-60_B", Initial_year)

TRANSIT TIME = 20

UNITS: Hectares

DOCUMENT: The initial value is determined by both the choice of dataset and the initial year from which the value is taken. This should be matched to the initial year of the simulation run.

INFLOWS:

"Aging_of_forest_21-40" = CONVEYOR OUTFLOW

UNITS: Hectare/Year

DOCUMENT: Value determined by the value contained in slat [1] of the preceding conveyor stock.

OUTFLOWS:

"Aging_of_forest_41-60" = CONVEYOR OUTFLOW

UNITS: Hectare/Year

DOCUMENT: Value determined by the value contained in slat [1] of the preceding conveyor stock.

Forests_41_to_60_regenerating = LEAKAGE OUTFLOW

LEAKAGE FRACTION = SAFEDIV(("Extraction_of_wood_from_forest_age_41-60"/Average_density_of_forest_age_41_to_60)*Fraction_of_forest_area_undergoing_complete_regeneration, Forest_area_age_41_to_60/Unit_of_measure_of_transit_time, 0)

UNITS: Hectare/Year

DOCUMENT: SAFEDIV is used to ensure model run continuation in situations where there is a forest depletion.

'Extraction of wood' / 'Average density' * 'Fraction of forest area...' is used to determine the absolute amount of forest area regeneration.

The division with 'forest area' / 'transit time' is there to determine the relative amount, as leakage outflows from conveyor stocks require fractional values, not absolute values.

Forest_area_age_61_to_80(t) = Forest_area_age_61_to_80(t - dt) + ("Aging_of_forest_41-60" - "Aging_of_forest_61-80" - Forests_61_to_80_regenerating) * dt {CONVEYOR}

INIT Forest_area_age_61_to_80 = HISTORY(IF Dataset_version=0 THEN "MOE_Forest_area_61-80"*Hist."Forest_area_age_61-80_A" ELSE "MOE_Forest_area_61-80"*Hist."Forest_area_age_61-80_B", Initial_year)

TRANSIT TIME = 20

UNITS: Hectares

DOCUMENT: The initial value is determined by both the choice of dataset and the initial year from which the value is taken. This should be matched to the initial year of the simulation run.

INFLOWS:

"Aging_of_forest_41-60" = CONVEYOR OUTFLOW

UNITS: Hectare/Year

DOCUMENT: Value determined by the value contained in slat [1] of the preceding conveyor stock.

OUTFLOWS:

"Aging_of_forest_61-80" = CONVEYOR OUTFLOW

UNITS: Hectare/Year

DOCUMENT: Value determined by the value contained in slat [1] of the preceding conveyor stock.

Forests_61_to_80_regenerating = LEAKAGE OUTFLOW

LEAKAGE FRACTION = SAFEDIV(("Extraction_of_wood_from_forest_age_61-80"/Average_density_of_forest_age_61_to_80)*Fraction_of_forest_area_undergoing_complete_regeneration, Forest_area_age_61_to_80/Unit_of_measure_of_transit_time, 0)

UNITS: Hectare/Year

DOCUMENT: SAFEDIV is used to ensure model run continuation in situations where there is a forest depletion.

'Extraction of wood' / 'Average density' * 'Fraction of forest area...' is used to determine the absolute amount of forest area regeneration.

The division with 'forest area' / 'transit time' is there to determine the relative amount, as leakage outflows from conveyor stocks require fractional values, not absolute values.

Forest_area_age_81_to_100(t) = Forest_area_age_81_to_100(t - dt) + ("Aging_of_forest_61-80" - "Aging_of_forest_81-100" - Forests_81_to_100_regenerating) * dt {CONVEYOR}

INIT Forest_area_age_81_to_100 = HISTORY(IF Dataset_version=0 THEN "MOE_Forest_area_81-100"*Hist."Forest_area_age_81-100_A" ELSE "MOE_Forest_area_81-100"*Hist."Forest_area_age_81-100_B", Initial_year)

TRANSIT TIME = 20

UNITS: Hectares

DOCUMENT: The initial value is determined by both the choice of dataset and the initial year from which the value is taken. This should be matched to the initial year of the simulation run.

INFLOWS:

"Aging_of_forest_61-80" = CONVEYOR OUTFLOW

UNITS: Hectare/Year

DOCUMENT: Value determined by the value contained in slat [1] of the preceding conveyor stock.

OUTFLOWS:

"Aging_of_forest_81-100" = CONVEYOR OUTFLOW

UNITS: Hectare/Year

DOCUMENT: Value determined by the value contained in slat [1] of the preceding conveyor stock.

Forests_81_to_100_regenerating = LEAKAGE OUTFLOW

LEAKAGE FRACTION = SAFEDIV(("Extraction_of_wood_from_forest_age_81-100"/Average_density_of_forest_age_81_to_100)*Fraction_of_forest_area_undergoing_complete_regeneration, Forest_area_age_81_to_100/Unit_of_measure_of_transit_time, 0)

UNITS: Hectare/Year

DOCUMENT: SAFEDIV is used to ensure model run continuation in situations where there is a forest depletion.

'Extraction of wood' / 'Average density' * 'Fraction of forest area...' is used to determine the absolute amount of forest area regeneration.

The division with 'forest area' / 'transit time' is there to determine the relative amount, as leakage outflows from conveyor stocks require fractional values, not absolute values.

Volume_of_wood_in_forest_age_1_to_20(t) = Volume_of_wood_in_forest_age_1_to_20(t - dt) + ("Growth_function_1-20".Growth_within_stock - "Change_in_volume_of_wood_from_movement_between_stocks_1-20" - "Extraction_of_wood_from_forest_age_1-20") * dt

INIT Volume_of_wood_in_forest_age_1_to_20 = HISTORY(Hist."Density_of_forest_age_1-20", Initial_year)*Forest_area_age_1_to_20

UNITS: Cubic Meters

DOCUMENT: The initial value is determined by both the initial year from which the value is taken. This should be matched to the initial year of the simulation run.

INFLOWS:

Change_in_volume_of_wood_from_aging_within_stock =

UNITS: Cubic Meter/Year

OUTFLOWS:

"Change_in_volume_of_wood_from_movement_between_stocks_1-20" = Average_density_of_forest_age_20*"Aging_of_forest_1-20"

UNITS: Cubic Meters/Year

DOCUMENT: Definition:

Coflow for the main aging chain of forested areas. Determined by the aging of the forest, and the average density of that forest.

"Extraction_of_wood_from_forest_age_1-20" = MIN("Indicated_logging_level_from_forest_age_1-20"*Global_logging_level_control,

Volume_of_wood_in_forest_age_1_to_20/Unit_of_measure_of_transit_time)

UNITS: Cubic Meters/Year

DOCUMENT: Definition:

Total volume of wood extracted yearly from forests belonging to age group 1-20. Includes accidental products.

Timber extracted from this age group is classified as "secondary product", since the primary purpose of cutting within this age group is not to extract timber, but to increase the yield of the forest by creating space for growth for selected specimens.

Also includes trees dying of natural causes, these may or may not be extracted as hygiene products.

Values have been calculated in such a manner as to reproduce the reference mode of behavior.
Volume_of_wood_in_forest_age_101_to_120(t) = Volume_of_wood_in_forest_age_101_to_120(t - dt) + ("Change_in_volume_of_wood_from_movement_between_stocks_81-100" + "Growth_function_101-120".Growth_within_stock - "Change_in_volume_of_wood_from_movement_between_stocks_101-120" - "Extraction_of_wood_from_forest_age_101-120") * dt

INIT Volume_of_wood_in_forest_age_101_to_120 = HISTORY(Hist."Density_of_forest_age_101-120", Initial_year)*Forest_area_age_101_to_120

UNITS: Cubic Meters

DOCUMENT: The initial value is determined by both the initial year from which the value is taken. This should be matched to the initial year of the simulation run.

INFLOWS:

"Change_in_volume_of_wood_from_movement_between_stocks_81-100" =
Average_density_of_forest_age_100*"Aging_of_forest_81-100"

UNITS: Cubic Meters/Year

DOCUMENT: Definition:

Coflow for the main aging chain of forested areas. Determined by the aging of the forest, and the average density of that forest.

Flow_6 =

UNITS: Cubic Meter/Year

OUTFLOWS:

"Change_in_volume_of_wood_from_movement_between_stocks_101-120" =
Average_density_of_forest_age_120*"Aging_of_forest_101-120"

UNITS: Cubic Meters/Year

DOCUMENT: Definition:

Coflow for the main aging chain of forested areas. Determined by the aging of the forest, and the average density of that forest.

"Extraction_of_wood_from_forest_age_101-120" =
MIN("Indicated_logging_level_from_forest_age_101-120"*Global_logging_level_control +
Indicated_extra_logging_1*Global_logging_level_control,
Volume_of_wood_in_forest_age_101_to_120/Unit_of_measure_of_transit_time)

UNITS: Cubic Meters/Year

DOCUMENT: Definition:

Total volume of wood extracted yearly from forests belonging to age group 1-20. Includes accidental products.

Timber extracted from this age group is classified as "primary product", since the primary purpose of cutting within this age group is not to extract timber, but to increase the yield of the forest by creating space for growth for selected specimens.

Also includes trees dying of natural causes, these may or may not be extracted as hygiene products.

Values have been calculated in such a manner as to reproduce the reference mode of behavior.

'Indicated extra logging' variables are policy variables meant to switch logging levels from younger stocks to older stocks as younger stocks are depleted.

Volume_of_wood_in_forest_age_121_to_140(t) = Volume_of_wood_in_forest_age_121_to_140(t - dt)
+ ("Change_in_volume_of_wood_from_movement_between_stocks_101-120" +
"Growth_function_121-140".Growth_within_stock -
"Change_in_volume_of_wood_from_movement_between_stocks_121-140" -
"Extraction_of_wood_from_forest_age_121-140") * dt

INIT Volume_of_wood_in_forest_age_121_to_140 = HISTORY(Hist."Density_of_forest_age_121-140",
Initial_year)*Forest_area_age_121_to_140

UNITS: Cubic Meters

DOCUMENT: The initial value is determined by both the initial year from which the value is taken. This should be matched to the initial year of the simulation run.

INFLOWS:

"Change_in_volume_of_wood_from_movement_between_stocks_101-120" =
Average_density_of_forest_age_120*"Aging_of_forest_101-120"

UNITS: Cubic Meters/Year

DOCUMENT: Definition:

Coflow for the main aging chain of forested areas. Determined by the aging of the forest, and the average density of that forest.

Flow_7 =

UNITS: Cubic Meter/Year

OUTFLOWS:

"Change_in_volume_of_wood_from_movement_between_stocks_121-140" =
Average_density_of_forest_age_140*"Aging_of_forest_121-140"

UNITS: Cubic Meters/Year

DOCUMENT: Definition:

Coflow for the main aging chain of forested areas. Determined by the aging of the forest, and the average density of that forest.

"Extraction_of_wood_from_forest_age_121-140" =

MIN("Indicated_logging_level_from_forest_age_121-140" + Indicated_extra_logging_1,
Volume_of_wood_in_forest_age_121_to_140/Unit_of_measure_of_transit_time)

UNITS: Cubic Meters/Year

DOCUMENT: Definition:

Total volume of wood extracted yearly from forests belonging to age group 1-20. Includes accidental products.

Timber extracted from this age group is classified as "primary product", since the primary purpose of cutting within this age group is not to extract timber, but to increase the yield of the forest by creating space for growth for selected specimens.

Also includes trees dying of natural causes, these may or may not be extracted as hygiene products.

Values have been calculated in such a manner as to reproduce the reference mode of behavior.

'Indicated extra logging' variables are policy variables meant to switch logging levels from younger stocks to older stocks as younger stocks are depleted.

Volume_of_wood_in_forest_age_141_to_160(t) = Volume_of_wood_in_forest_age_141_to_160(t - dt)
+ ("Change_in_volume_of_wood_from_movement_between_stocks_121-140" +
"Growth_function_141-160".Growth_within_stock -
"Change_in_volume_of_wood_from_movement_between_stocks_141-160" -
"Extraction_of_wood_from_forest_age_141-160") * dt

INIT Volume_of_wood_in_forest_age_141_to_160 = HISTORY(Hist."Density_of_forest_age_141-160",
Initial_year)*Forest_area_age_141_to_160

UNITS: Cubic Meters

DOCUMENT: The initial value is determined by both the initial year from which the value is taken. This should be matched to the initial year of the simulation run.

INFLOWS:

"Change_in_volume_of_wood_from_movement_between_stocks_121-140" =
Average_density_of_forest_age_140*"Aging_of_forest_121-140"

UNITS: Cubic Meters/Year

DOCUMENT: Definition:

Coflow for the main aging chain of forested areas. Determined by the aging of the forest, and the average density of that forest.

Flow_8 =

UNITS: Cubic Meter/Year

OUTFLOWS:

"Change_in_volume_of_wood_from_movement_between_stocks_141-160" =
Average_density_of_forest_age_160*"Aging_of_forest_141-160"

UNITS: Cubic Meters/Year

DOCUMENT: Definition:

Coflow for the main aging chain of forested areas. Determined by the aging of the forest, and the average density of that forest.

"Extraction_of_wood_from_forest_age_141-160" =

MIN("Indicated_logging_level_from_forest_age_141-

160"+Indicated_extra_logging_1+Indicated_extra_logging_2,

Volume_of_wood_in_forest_age_141_to_160/Unit_of_measure_of_transit_time)

UNITS: Cubic Meters/Year

DOCUMENT: Definition:

Total volume of wood extracted yearly from forests belonging to age group 1-20. Includes accidental products.

Timber extracted from this age group is classified as "primary product", since the primary purpose of cutting within this age group is not to extract timber, but to increase the yield of the forest by creating space for growth for selected specimens.

Also includes trees dying of natural causes, these may or may not be extracted as hygiene products.

Values have been calculated in such a manner as to reproduce the reference mode of behavior.

'Indicated extra logging' variables are policy variables meant to switch logging levels from younger stocks to older stocks as younger stocks are depleted.

Volume_of_wood_in_forest_age_161_to_180(t) = Volume_of_wood_in_forest_age_161_to_180(t - dt)

+ ("Change_in_volume_of_wood_from_movement_between_stocks_141-160" +

"Growth_function_161-_180".Growth_within_stock -

"Change_in_volume_of_wood_from_movement_between_stocks_161-_180" -

"Extraction_of_wood_from_forest_age_161-180") * dt

INIT Volume_of_wood_in_forest_age_161_to_180 = HISTORY(Hist."Density_of_forest_age_161-180",
Initial_year)*Forest_area_age_161_to_180

UNITS: Cubic Meters

DOCUMENT: The initial value is determined by both the initial year from which the value is taken. This should be matched to the initial year of the simulation run.

INFLOWS:

"Change_in_volume_of_wood_from_movement_between_stocks_141-160" =
Average_density_of_forest_age_160*"Aging_of_forest_141-160"

UNITS: Cubic Meters/Year

DOCUMENT: Definition:

Coflow for the main aging chain of forested areas. Determined by the aging of the forest, and the average density of that forest.

Flow_9 =

UNITS: Cubic Meter/Year

OUTFLOWS:

"Change_in_volume_of_wood_from_movement_between_stocks_161-180" =
Average_density_of_forest_age_180*"Aging_of_forest_161-180"

UNITS: Cubic Meters/Year

DOCUMENT: Definition:

Coflow for the main aging chain of forested areas. Determined by the aging of the forest, and the average density of that forest.

"Extraction_of_wood_from_forest_age_161-180" =

MIN("Indicated_logging_level_from_forest_age_161-

180"+Indicated_extra_logging_1+Indicated_extra_logging_2,

Volume_of_wood_in_forest_age_161_to_180/Unit_of_measure_of_transit_time)

UNITS: Cubic Meters/Year

DOCUMENT: Definition:

Total volume of wood extracted yearly from forests belonging to age group 1-20. Includes accidental products.

Timber extracted from this age group is classified as "primary product", since the primary purpose of cutting within this age group is not to extract timber, but to increase the yield of the forest by creating space for growth for selected specimens.

Also includes trees dying of natural causes, these may or may not be extracted as hygiene products.

Values have been calculated in such a manner as to reproduce the reference mode of behavior.

'Indicated extra logging' variables are policy variables meant to switch logging levels from younger stocks to older stocks as younger stocks are depleted.

Volume_of_wood_in_forest_age_181_and_above(t) =

Volume_of_wood_in_forest_age_181_and_above(t - dt) +

("Change_in_volume_of_wood_from_movement_between_stocks_161-180" +

Growth_function_181_and_above.Growth_within_stock -

Extraction_of_wood_from_forest_age_181_and_above) * dt

INIT Volume_of_wood_in_forest_age_181_and_above =

HISTORY(Hist.Density_of_forest_age_181_and_above, Initial_year)*Forest_area_age_181_and_above

UNITS: Cubic Meters

DOCUMENT: The initial value is determined by both the initial year from which the value is taken. This should be matched to the initial year of the simulation run.

INFLOWS:

"Change_in_volume_of_wood_from_movement_between_stocks_161-180" =
Average_density_of_forest_age_180*"Aging_of_forest_161-180"

UNITS: Cubic Meters/Year

DOCUMENT: Definition:

Coflow for the main aging chain of forested areas. Determined by the aging of the forest, and the average density of that forest.

Flow_10 =

UNITS: Cubic Meter/Year

OUTFLOWS:

Extraction_of_wood_from_forest_age_181_and_above =

MIN(Indicated_logging_level_from_forest_age_181_and_above+Indicated_extra_logging_1+Indicated_extra_logging_2+Indicated_extra_logging_3,

Volume_of_wood_in_forest_age_181_and_above/Unit_of_measure_of_transit_time)

UNITS: Cubic Meters/Year

DOCUMENT: Definition:

Total volume of wood extracted yearly from forests belonging to age group 1-20. Includes accidental products.

Timber extracted from this age group is classified as "primary product", since the primary purpose of cutting within this age group is not to extract timber, but to increase the yield of the forest by creating space for growth for selected specimens.

Also includes trees dying of natural causes, these may or may not be extracted as hygiene products.

Values have been calculated in such a manner as to reproduce the reference mode of behavior.

'Indicated extra logging' variables are policy variables meant to switch logging levels from younger stocks to older stocks as younger stocks are depleted.

Volume_of_wood_in_forest_age_21_to_40(t) = Volume_of_wood_in_forest_age_21_to_40(t - dt) + ("Change_in_volume_of_wood_from_movement_between_stocks_1-20" + "Growth_function_21-40".Growth_within_stock - "Change_in_volume_of_wood_from_movement_between_stocks_21-40" - "Extraction_of_wood_from_forest_age_21-40") * dt

INIT Volume_of_wood_in_forest_age_21_to_40 = HISTORY(Hist."Density_of_forest_age_21-40", Initial_year)*Forest_area_age_21_to_40

UNITS: Cubic Meters

DOCUMENT: The initial value is determined by both the initial year from which the value is taken. This should be matched to the initial year of the simulation run.

INFLOWS:

"Change_in_volume_of_wood_from_movement_between_stocks_1-20" = Average_density_of_forest_age_20*"Aging_of_forest_1-20"

UNITS: Cubic Meters/Year

DOCUMENT: Definition:

Coflow for the main aging chain of forested areas. Determined by the aging of the forest, and the average density of that forest.

Flow_2 =

UNITS: Cubic Meter/Year

OUTFLOWS:

"Change_in_volume_of_wood_from_movement_between_stocks_21-40" = Average_density_of_forest_age_40*"Aging_of_forest_21-40"

UNITS: Cubic Meters/Year

DOCUMENT: Definition:

Coflow for the main aging chain of forested areas. Determined by the aging of the forest, and the average density of that forest.

"Extraction_of_wood_from_forest_age_21-40" =
MIN("Indicated_logging_level_from_forest_age_21-40"*Global_logging_level_control,
Volume_of_wood_in_forest_age_21_to_40/Unit_of_measure_of_transit_time)
UNITS: Cubic Meters/Year
DOCUMENT: Definition:
Total volume of wood extracted yearly from forests belonging to age group 1-20. Includes accidental products.

Timber extracted from this age group is classified as "secondary product", since the primary purpose of cutting within this age group is not to extract timber, but to increase the yield of the forest by creating space for growth for selected specimens.

Also includes trees dying of natural causes, these may or may not be extracted as hygiene products.

Values have been calculated in such a manner as to reproduce the reference mode of behavior.
$$\text{Volume_of_wood_in_forest_age_41_to_60}(t) = \text{Volume_of_wood_in_forest_age_41_to_60}(t - dt) +$$

("Change_in_volume_of_wood_from_movement_between_stocks_21-40" + "Growth_function_41-60".Growth_within_stock - "Change_in_volume_of_wood_from_movement_between_stocks_41-60" - "Extraction_of_wood_from_forest_age_41-60") * dt

INIT Volume_of_wood_in_forest_age_41_to_60 = HISTORY(Hist."Density_of_forest_age_41-60", Initial_year)*Forest_area_age_41_to_60

UNITS: Cubic Meters

DOCUMENT: The initial value is determined by both the initial year from which the value is taken. This should be matched to the initial year of the simulation run.

INFLOWS:

"Change_in_volume_of_wood_from_movement_between_stocks_21-40" =
Average_density_of_forest_age_40*"Aging_of_forest_21-40"

UNITS: Cubic Meters/Year

DOCUMENT: Definition:

Coflow for the main aging chain of forested areas. Determined by the aging of the forest, and the average density of that forest.

Flow_3 =

UNITS: Cubic Meter/Year

OUTFLOWS:

"Change_in_volume_of_wood_from_movement_between_stocks_41-60" =
Average_density_of_forest_age_60*"Aging_of_forest_41-60"

UNITS: Cubic Meters/Year

DOCUMENT: Definition:

Coflow for the main aging chain of forested areas. Determined by the aging of the forest, and the average density of that forest.

"Extraction_of_wood_from_forest_age_41-60" =
MIN("Indicated_logging_level_from_forest_age_41-60"*Global_logging_level_control,
Volume_of_wood_in_forest_age_41_to_60/Unit_of_measure_of_transit_time)

UNITS: Cubic Meters/Year

DOCUMENT: Definition:

Total volume of wood extracted yearly from forests belonging to age group 1-20. Includes accidental products.

Timber extracted from this age group is classified as "secondary product", since the primary purpose of cutting within this age group is not to extract timber, but to increase the yield of the forest by creating space for growth for selected specimens.

Also includes trees dying of natural causes, these may or may not be extracted as hygiene products.

Values have been calculated in such a manner as to reproduce the reference mode of behavior.
$$\text{Volume_of_wood_in_forest_age_61_to_80}(t) = \text{Volume_of_wood_in_forest_age_61_to_80}(t - dt) + (\text{"Change_in_volume_of_wood_from_movement_between_stocks_41-60"} + \text{"Growth_function_61-80"} \cdot \text{Growth_within_stock} - \text{"Change_in_volume_of_wood_from_movement_between_stocks_61-80"} - \text{"Extraction_of_wood_from_forest_age_61-80"}) * dt$$

INIT Volume_of_wood_in_forest_age_61_to_80 = HISTORY(Hist."Density_of_forest_age_61-80", Initial_year)*Forest_area_age_61_to_80

UNITS: Cubic Meters

DOCUMENT: The initial value is determined by both the initial year from which the value is taken. This should be matched to the initial year of the simulation run.

INFLOWS:

"Change_in_volume_of_wood_from_movement_between_stocks_41-60" =
Average_density_of_forest_age_60*"Aging_of_forest_41-60"

UNITS: Cubic Meters/Year

DOCUMENT: Definition:

Coflow for the main aging chain of forested areas. Determined by the aging of the forest, and the average density of that forest.

Flow_4 =

UNITS: Cubic Meter/Year

OUTFLOWS:

"Change_in_volume_of_wood_from_movement_between_stocks_61-80" =
Average_density_of_forest_age_80*"Aging_of_forest_61-80"

UNITS: Cubic Meters/Year

DOCUMENT: Definition:

Coflow for the main aging chain of forested areas. Determined by the aging of the forest, and the average density of that forest.

"Extraction_of_wood_from_forest_age_61-80" =
MIN("Indicated_logging_level_from_forest_age_61-80"*Global_logging_level_control,
Volume_of_wood_in_forest_age_61_to_80/Unit_of_measure_of_transit_time)

UNITS: Cubic Meters/Year

DOCUMENT: Definition:

Total volume of wood extracted yearly from forests belonging to age group 1-20. Includes accidental products.

Timber extracted from this age group is classified as "primary product", since the primary purpose of cutting within this age group is not to extract timber, but to increase the yield of the forest by creating space for growth for selected specimens.

Also includes trees dying of natural causes, these may or may not be extracted as hygiene products.

Values have been calculated in such a manner as to reproduce the reference mode of behavior.
$$\text{Volume_of_wood_in_forest_age_81_to_100}(t) = \text{Volume_of_wood_in_forest_age_81_to_100}(t - dt) +$$

("Change_in_volume_of_wood_from_movement_between_stocks_61-80" + "Growth_function_81-100".Growth_within_stock - "Change_in_volume_of_wood_from_movement_between_stocks_81-100" - "Extraction_of_wood_from_forest_age_81-100") * dt

INIT Volume_of_wood_in_forest_age_81_to_100 = HISTORY(Hist."Density_of_forest_age_81-100", Initial_year)*Forest_area_age_81_to_100

UNITS: Cubic Meters

DOCUMENT: The initial value is determined by both the initial year from which the value is taken. This should be matched to the initial year of the simulation run.

INFLOWS:

"Change_in_volume_of_wood_from_movement_between_stocks_61-80" =
Average_density_of_forest_age_80*"Aging_of_forest_61-80"

UNITS: Cubic Meters/Year

DOCUMENT: Definition:

Coflow for the main aging chain of forested areas. Determined by the aging of the forest, and the average density of that forest.

Flow_5 =

UNITS: Cubic Meter/Year

OUTFLOWS:

"Change_in_volume_of_wood_from_movement_between_stocks_81-100" =
Average_density_of_forest_age_100*"Aging_of_forest_81-100"

UNITS: Cubic Meters/Year

DOCUMENT: Definition:

Coflow for the main aging chain of forested areas. Determined by the aging of the forest, and the average density of that forest.

"Extraction_of_wood_from_forest_age_81-100" =
MIN("Indicated_logging_level_from_forest_age_81-100"*Global_logging_level_control,
Volume_of_wood_in_forest_age_81_to_100/Unit_of_measure_of_transit_time)

UNITS: Cubic Meters/Year

DOCUMENT: Definition:

Total volume of wood extracted yearly from forests belonging to age group 1-20. Includes accidental products.

Timber extracted from this age group is classified as "primary product", since the primary purpose of cutting within this age group is not to extract timber, but to increase the yield of the forest by creating space for growth for selected specimens.

Also includes trees dying of natural causes, these may or may not be extracted as hygiene products.

Values have been calculated in such a manner as to reproduce the reference mode of behavior.
$$\text{Average_density_of_forest_age_1_to_20} = \text{SAFEDIV}(\text{Volume_of_wood_in_forest_age_1_to_20},$$

Forest_area_age_1_to_20, 0)

UNITS: Cubic Meters/Hectares

DOCUMENT: SAFEDIV is used in order to ensure model run continuation in situations of forest depletion.

Average_density_of_forest_age_100 =
Relative_average_density_of_forest_age_81_to_100*Initial_average_density_of_forest_age_100

UNITS: Cubic Meter/Hectare

DOCUMENT: Definition:

The volume of wood to be found on average in a hectare of forest that is 100 years old. Estimated based on data from the National Forest Inventory. Calculations can be found in Appendix C.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

Average_density_of_forest_age_101_to_120 = SAFEDIV(Volume_of_wood_in_forest_age_101_to_120,
Forest_area_age_101_to_120, 0)

UNITS: Cubic Meters/Hectare

DOCUMENT: SAFEDIV is used in order to ensure model run continuation in situations of forest depletion.

Average_density_of_forest_age_120 =

Relative_average_density_of_forest_age_101_to_120*Initial_average_density_of_forest_age_120

UNITS: Cubic Meter/Hectare

DOCUMENT: Definition:

The volume of wood to be found on average in a hectare of forest that is 120 years old. Estimated based on data from the National Forest Inventory. Calculations can be found in Appendix C.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

Average_density_of_forest_age_121_to_140 = SAFEDIV(Volume_of_wood_in_forest_age_121_to_140,
Forest_area_age_121_to_140, 0)

UNITS: Cubic Meters/Hectare

DOCUMENT: SAFEDIV is used in order to ensure model run continuation in situations of forest depletion.

Average_density_of_forest_age_140 =

Initial_average_density_of_forest_age_140*Relative_average_density_of_forest_age_121_to_140

UNITS: Cubic Meter/Hectare

DOCUMENT: Definition:

The volume of wood to be found on average in a hectare of forest that is 140 years old. Estimated based on data from the National Forest Inventory. Calculations can be found in Appendix C.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

Average_density_of_forest_age_141_to_160 = SAFEDIV(Volume_of_wood_in_forest_age_141_to_160, Forest_area_age_141_to_160, 0)

UNITS: Cubic Meters/Hectare

DOCUMENT: SAFEDIV is used in order to ensure model run continuation in situations of forest depletion.

Average_density_of_forest_age_160 =

Relative_average_density_of_forest_age_141_to_160*Initial_average_density_of_forest_age_160

UNITS: Cubic Meter/Hectare

DOCUMENT: Definition:

The volume of wood to be found on average in a hectare of forest that is 160 years old. Estimated based on data from the National Forest Inventory. Calculations can be found in Appendix C.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

Average_density_of_forest_age_161_to_180 = SAFEDIV(Volume_of_wood_in_forest_age_161_to_180, Forest_area_age_161_to_180, 0)

UNITS: Cubic Meters/Hectare

DOCUMENT: SAFEDIV is used in order to ensure model run continuation in situations of forest depletion.

Average_density_of_forest_age_180 =

Initial_average_density_of_forest_age_180*Relative_average_density_of_forest_age_161_to_180

UNITS: Cubic Meter/Hectare

DOCUMENT: Definition:

The volume of wood to be found on average in a hectare of forest that is 180 years old. Estimated based on data from the National Forest Inventory. Calculations can be found in Appendix C.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

Average_density_of_forest_age_181_and_above =

SAFEDIV(Volume_of_wood_in_forest_age_181_and_above, Forest_area_age_181_and_above, 0)

UNITS: Cubic Meters/Hectare

DOCUMENT: SAFEDIV is used in order to ensure model run continuation in situations of forest depletion.

Average_density_of_forest_age_20 =

Initial_average_density_of_forest_age_20*Relative_average_density_of_forest_age_1_to_20

UNITS: Cubic Meter/Hectare

DOCUMENT: Definition:

The volume of wood to be found on average in a hectare of forest that is 20 years old. Estimated based on data from the National Forest Inventory. Calculations can be found in Appendix C.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

Average_density_of_forest_age_21_to_40 = SAFEDIV(Volume_of_wood_in_forest_age_21_to_40, Forest_area_age_21_to_40, 0)

UNITS: Cubic Meters/Hectares

DOCUMENT: SAFEDIV is used in order to ensure model run continuation in situations of forest depletion.

Average_density_of_forest_age_40 =

Relative_average_density_of_forest_age_21_to_40*Initial_average_density_of_forest_age_40

UNITS: Cubic Meter/Hectare

Average_density_of_forest_age_41_to_60 = SAFEDIV(Volume_of_wood_in_forest_age_41_to_60, Forest_area_age_41_to_60, 0)

UNITS: Cubic Meters/Hectare

DOCUMENT: SAFEDIV is used in order to ensure model run continuation in situations of forest depletion.

Average_density_of_forest_age_60 =

Relative_average_density_of_forest_age_41_to_60*Initial_average_density_of_forest_age_60

UNITS: Cubic Meter/Hectare

DOCUMENT: Definition:

The volume of wood to be found on average in a hectare of forest that is 60 years old. Estimated based on data from the National Forest Inventory. Calculations can be found in Appendix C.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

Average_density_of_forest_age_61_to_80 = SAFEDIV(Volume_of_wood_in_forest_age_61_to_80, Forest_area_age_61_to_80, 0)

UNITS: Cubic Meters/Hectare

DOCUMENT: SAFEDIV is used in order to ensure model run continuation in situations of forest depletion.

Average_density_of_forest_age_80 =

Initial_average_density_of_forest_age_80*Relative_average_density_of_forest_age_61_to_80

UNITS: Cubic Meter/Hectare

Average_density_of_forest_age_81_to_100 = SAFEDIV(Volume_of_wood_in_forest_age_81_to_100, Forest_area_age_81_to_100, 0)

UNITS: Cubic Meters/Hectare

DOCUMENT: SAFEDIV is used in order to ensure model run continuation in situations of forest depletion.

Dataset_version = 1

UNITS: dmnl

DOCUMENT: Control variable for switching between dataset A and B. Value 0 for dataset A. All other values for dataset B.

See Annex C for how the datasets were obtained.

"Error_demonstration_-_one_slut_from_stock" = Growth_per_hectare*Forest_area_age_1_to_20[160]
UNITS: Cubic Meters/Year

DOCUMENT: Extra variable used to reproduce the bug that is causing a unit warning.

"Error_demonstration_-_whole_stock" = Growth_per_hectare*Forest_area_age_1_to_20
UNITS: Cubic Meters/Year

DOCUMENT: Extra variable used to reproduce the bug that is causing a unit warning.

"Estimated_logging_level_from_forest_age_1-100" = "Extraction_of_wood_from_forest_age_1-20" +
"Extraction_of_wood_from_forest_age_21-40" + "Extraction_of_wood_from_forest_age_41-60" +
"Extraction_of_wood_from_forest_age_61-80" + "Extraction_of_wood_from_forest_age_81-100"
UNITS: Cubic Meter/Year

"Estimated_logging_level_from_forest_age_101-140" = "Extraction_of_wood_from_forest_age_101-
120" + "Extraction_of_wood_from_forest_age_121-140"
UNITS: Cubic Meter/Year

"Estimated_logging_level_from_forest_age_141-180" = "Extraction_of_wood_from_forest_age_141-
160" + "Extraction_of_wood_from_forest_age_161-180"
UNITS: Cubic Meter/Year

Fraction_of_forest_area_undergoing_complete_regeneration = 0.92
UNITS: dmnl

DOCUMENT: Definition:

Most silvicultural systems applied in Romania lead to a complete regeneration of the forested area over a certain period of time.

(Regeneration in this case means that the stock of forests will start growing again from seeds, implying a transition from any given stock from the aging chain to the beginning of the aging chain.)

Notable exceptions are the coppice system and the selection system, where individual trees are affected, but the forested area as a whole retains its age. Conservation cuttings are also considered to lead to complete regeneration.

The fraction of forest area undergoing complete regeneration has been estimated based on data for 2012-2017 from yearly government reports on the state of the forest.

Global_logging_level_control = 1
UNITS: dmnl

DOCUMENT: Control variable enabling the increase or decrease of logging levels proportionally across all age groups.

Growth_per_hectare = 0
UNITS: Cubic Meters/Hectares/Year

DOCUMENT: Extra variable used to reproduce the bug that is causing a unit warning.

Indicated_extra_logging_1 = (INIT("Estimated_logging_level_from_forest_age_1-100")-
"Estimated_logging_level_from_forest_age_1-100")/5

UNITS: Cubic Meter/Year

DOCUMENT: Definition:

Policy variable. Whatever indicated logging from forests aged 1-100 is not available, due to depletion of the stocks in question, is distributed evenly among forests aged 101 and above.

Indicated_extra_logging_2 = (INIT("Estimated_logging_level_from_forest_age_101-140")+
Indicated_extra_logging_1*2-"Estimated_logging_level_from_forest_age_101-140")/3

UNITS: Cubic Meter/Year

DOCUMENT: Definition:

Policy variable. Whatever indicated logging from forests aged 101-140 is not available, due to depletion of the stocks in question, is distributed evenly among forests aged 141 and above.

Indicated_extra_logging_3 = INIT("Estimated_logging_level_from_forest_age_141-
180")+Indicated_extra_logging_2*2+Indicated_extra_logging_1*2-
"Estimated_logging_level_from_forest_age_141-180"

UNITS: Cubic Meter/Year

DOCUMENT: Definition:

Policy variable. Whatever indicated logging from forests aged 141-180 is not available, due to depletion of the stocks in question, is instead sought from forests aged 181 and above.

"Indicated_logging_level_from_forest_age_1-20" = 0

UNITS: Cubic Meter/Year

DOCUMENT: Estimated based on deviation from the reference mode of simulation run with 0 logging.

"Indicated_logging_level_from_forest_age_101-120" = IF Dataset_version = 0 THEN 6100000 ELSE
6750000

UNITS: Cubic Meter/Year

DOCUMENT: Estimated based on deviation from the reference mode of simulation run with 0 logging.

"Indicated_logging_level_from_forest_age_121-140" = IF Dataset_version = 0 THEN 7120000 ELSE
5400000

UNITS: Cubic Meter/Year

DOCUMENT: Estimated based on deviation from the reference mode of simulation run with 0 logging.

"Indicated_logging_level_from_forest_age_141-160" = IF Dataset_version = 0 THEN 0 ELSE 0

UNITS: Cubic Meter/Year

DOCUMENT: Estimated based on deviation from the reference mode of simulation run with 0 logging.

"Indicated_logging_level_from_forest_age_161-180" = IF Dataset_version = 0 THEN 1020000 ELSE
2030000

UNITS: Cubic Meter/Year

DOCUMENT: Estimated based on deviation from the reference mode of simulation run with 0 logging.

Indicated_logging_level_from_forest_age_181_and_above = IF Dataset_version = 0 THEN 2230000 ELSE
530000

UNITS: Cubic Meter/Year

DOCUMENT: Estimated based on deviation from the reference mode of simulation run with 0 logging.

"Indicated_logging_level_from_forest_age_21-40" = IF Dataset_version = 0 THEN 5150000 ELSE
5150000

UNITS: Cubic Meter/Year

DOCUMENT: Estimated based on deviation from the reference mode of simulation run with 0 logging.

"Indicated_logging_level_from_forest_age_41-60" = IF Dataset_version = 0 THEN 2860000 ELSE
3900000

UNITS: Cubic Meter/Year

DOCUMENT: Estimated based on deviation from the reference mode of simulation run with 0 logging.

"Indicated_logging_level_from_forest_age_61-80" = IF Dataset_version = 0 THEN 6900000 ELSE
6615000

UNITS: Cubic Meter/Year

DOCUMENT: Estimated based on deviation from the reference mode of simulation run with 0 logging.
"Indicated_logging_level_from_forest_age_81-100" = IF Dataset_version = 0 THEN 4800000 ELSE 4350000

UNITS: Cubic Meter/Year

DOCUMENT: Estimated based on deviation from the reference mode of simulation run with 0 logging.
Initial_average_density_of_forest_age_100 =

MOE_density_of_forest_100*Hist.Average_density_of_forest_age_100

UNITS: Cubic Meter/Hectare

DOCUMENT: Definition:

Average density of 100 year old forests in 2012. The value is applied a statistical margin of error in latin hypercube testing.

Initial_average_density_of_forest_age_120 =

MOE_density_of_forest_120*Hist.Average_density_of_forest_age_120

UNITS: Cubic Meter/Hectare

DOCUMENT: Definition:

Average density of 120 year old forests in 2012. The value is applied a statistical margin of error in latin hypercube testing.

Initial_average_density_of_forest_age_140 =

MOE_density_of_forest_140*Hist.Average_density_of_forest_age_140

UNITS: Cubic Meter/Hectare

DOCUMENT: Definition:

Average density of 140 year old forests in 2012. The value is applied a statistical margin of error in latin hypercube testing.

Initial_average_density_of_forest_age_160 =

MOE_density_of_forest_160*Hist.Average_density_of_forest_age_160

UNITS: Cubic Meter/Hectare

DOCUMENT: Definition:

Average density of 160 year old forests in 2012. The value is applied a statistical margin of error in latin hypercube testing.

Initial_average_density_of_forest_age_180 =

MOE_density_of_forest_180*Hist.Average_density_of_forest_age_180

UNITS: Cubic Meter/Hectare

DOCUMENT: Definition:

Average density of 180 year old forests in 2012. The value is applied a statistical margin of error in latin hypercube testing.

Initial_average_density_of_forest_age_20 =

MOE_density_of_forest_20*Hist.Average_density_of_forest_age_20

UNITS: Cubic Meter/Hectare

DOCUMENT: Definition:

Average density of 20 year old forests in 2012. The value is applied a statistical margin of error in latin hypercube testing.

Initial_average_density_of_forest_age_40 =

MOE_density_of_forest_40*Hist.Average_density_of_forest_age_40

UNITS: Cubic Meter/Hectare

DOCUMENT: Definition:

Average density of 40 year old forests in 2012. The value is applied a statistical margin of error in latin hypercube testing.

Initial_average_density_of_forest_age_60 =
MOE_density_of_forest_60*Hist.Average_density_of_forest_age_60

UNITS: Cubic Meter/Hectare

DOCUMENT: Definition:

Average density of 60 year old forests in 2012. The value is applied a statistical margin of error in latin hypercube testing.

Initial_average_density_of_forest_age_80 =
MOE_density_of_forest_80*Hist.Average_density_of_forest_age_80

UNITS: Cubic Meter/Hectare

DOCUMENT: Definition:

Average density of 80 year old forests in 2012. The value is applied a statistical margin of error in latin hypercube testing.

Initial_year = 2012

UNITS: Year

DOCUMENT: Control variable for choosing the initial year of the simulation run. Recommended to be left at 2012, as it was used mostly to determine the reliability of data prior to 2012.

Maximum_forest_density_control = 1.1

UNITS: dmnl

DOCUMENT: Control variable for determining the maximum density to which forests can grow.

MOE_density_of_forest_100 = 1

UNITS: dmnl

DOCUMENT: Definition:

Variable used to run simulations across a range of uncertainty. The exact margin of error is taken from the National Forest Inventory. Though the margin of error is primarily applicable to dataset B, this model applies the same margin of error across the matching variables for dataset A and B.

Source:

NFI. (2012). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”.
<http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”.
<http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

MOE_density_of_forest_120 = 1

UNITS: dmnl

DOCUMENT: Definition:

Variable used to run simulations across a range of uncertainty. The exact margin of error is taken from the National Forest Inventory. Though the margin of error is primarily applicable to dataset B, this model applies the same margin of error across the matching variables for dataset A and B.

Source:

NFI. (2012). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”.
<http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”.
<http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

MOE_density_of_forest_140 = 1

UNITS: dmnl

DOCUMENT: Definition:

Variable used to run simulations across a range of uncertainty. The exact margin of error is taken from the National Forest Inventory. Though the margin of error is primarily applicable to dataset B, this model applies the same margin of error across the matching variables for dataset A and B.

Source:

NFI. (2012). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

MOE_density_of_forest_160 = 1

UNITS: dmnl

DOCUMENT: Definition:

Variable used to run simulations across a range of uncertainty. The exact margin of error is taken from the National Forest Inventory. Though the margin of error is primarily applicable to dataset B, this model applies the same margin of error across the matching variables for dataset A and B.

Source:

NFI. (2012). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

MOE_density_of_forest_180 = 1

UNITS: dmnl

DOCUMENT: Definition:

Variable used to run simulations across a range of uncertainty. The exact margin of error is taken from the National Forest Inventory. Though the margin of error is primarily applicable to dataset B, this model applies the same margin of error across the matching variables for dataset A and B.

Source:

NFI. (2012). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

MOE_density_of_forest_20 = 1

UNITS: dmnl

DOCUMENT: Definition:

Variable used to run simulations across a range of uncertainty. The exact margin of error is taken from the National Forest Inventory. Though the margin of error is primarily applicable to dataset B, this model applies the same margin of error across the matching variables for dataset A and B.

Source:

NFI. (2012). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

MOE_density_of_forest_40 = 1

UNITS: dmnl

DOCUMENT: Definition:

Variable used to run simulations across a range of uncertainty. The exact margin of error is taken from the National Forest Inventory. Though the margin of error is primarily applicable to dataset B, this model applies the same margin of error across the matching variables for dataset A and B.

Source:

NFI. (2012). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

MOE_density_of_forest_60 = 1

UNITS: dmnl

DOCUMENT: Definition:

Variable used to run simulations across a range of uncertainty. The exact margin of error is taken from the National Forest Inventory. Though the margin of error is primarily applicable to dataset B, this model applies the same margin of error across the matching variables for dataset A and B.

Source:

NFI. (2012). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

MOE_density_of_forest_80 = 1

UNITS: dmnl

DOCUMENT: Definition:

Variable used to run simulations across a range of uncertainty. The exact margin of error is taken from the National Forest Inventory. Though the margin of error is primarily applicable to dataset B, this model applies the same margin of error across the matching variables for dataset A and B.

Source:

NFI. (2012). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"MOE_Forest_area_1-20" = 1

UNITS: dmnl

DOCUMENT: Definition:

Variable used to run simulations across a range of uncertainty. The exact margin of error is taken from the National Forest Inventory. Though the margin of error is primarily applicable to dataset B, this model applies the same margin of error across the matching variables for dataset A and B.

Source:

NFI. (2012). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"MOE_Forest_area_101-120" = 1

UNITS: dmnl

DOCUMENT: Definition:

Variable used to run simulations across a range of uncertainty. The exact margin of error is taken from the National Forest Inventory. Though the margin of error is primarily applicable to dataset B, this model applies the same margin of error across the matching variables for dataset A and B.

Source:

NFI. (2012). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"MOE_Forest_area_121-140" = 1

UNITS: dmnl

DOCUMENT: Definition:

Variable used to run simulations across a range of uncertainty. The exact margin of error is taken from the National Forest Inventory. Though the margin of error is primarily applicable to dataset B, this model applies the same margin of error across the matching variables for dataset A and B.

Source:

NFI. (2012). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"MOE_Forest_area_141-160" = 1

UNITS: dmnl

DOCUMENT: Definition:

Variable used to run simulations across a range of uncertainty. The exact margin of error is taken from the National Forest Inventory. Though the margin of error is primarily applicable to dataset B, this model applies the same margin of error across the matching variables for dataset A and B.

Source:

NFI. (2012). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"MOE_Forest_area_161-180" = 1

UNITS: dmnl

DOCUMENT: Definition:

Variable used to run simulations across a range of uncertainty. The exact margin of error is taken from the National Forest Inventory. Though the margin of error is primarily applicable to dataset B, this model applies the same margin of error across the matching variables for dataset A and B.

Source:

NFI. (2012). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

MOE_Forest_area_181_and_above = 1

UNITS: dmnl

DOCUMENT: Definition:

Variable used to run simulations across a range of uncertainty. The exact margin of error is taken from the National Forest Inventory. Though the margin of error is primarily applicable to dataset B, this model applies the same margin of error across the matching variables for dataset A and B.

Source:

NFI. (2012). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"MOE_Forest_area_21-40" = 1

UNITS: dmnl

DOCUMENT: Definition:

Variable used to run simulations across a range of uncertainty. The exact margin of error is taken from the National Forest Inventory. Though the margin of error is primarily applicable to dataset B, this model applies the same margin of error across the matching variables for dataset A and B.

Source:

NFI. (2012). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"MOE_Forest_area_41-60" = 1

UNITS: dmnl

DOCUMENT: Definition:

Variable used to run simulations across a range of uncertainty. The exact margin of error is taken from the National Forest Inventory. Though the margin of error is primarily applicable to dataset B, this model applies the same margin of error across the matching variables for dataset A and B.

Source:

NFI. (2012). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"MOE_Forest_area_61-80" = 1

UNITS: dmnl

DOCUMENT: Definition:

Variable used to run simulations across a range of uncertainty. The exact margin of error is taken from the National Forest Inventory. Though the margin of error is primarily applicable to dataset B, this model applies the same margin of error across the matching variables for dataset A and B.

Source:

NFI. (2012). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"MOE_Forest_area_81-100" = 1

UNITS: dmnl

DOCUMENT: Definition:

Variable used to run simulations across a range of uncertainty. The exact margin of error is taken from the National Forest Inventory. Though the margin of error is primarily applicable to dataset B, this model applies the same margin of error across the matching variables for dataset A and B.

Source:

NFI. (2012). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"MOE_Growth_per_hectare_1-20" = 1

UNITS: dmnl

DOCUMENT: Definition:

Variable used to run simulations across a range of uncertainty. The exact margin of error is taken from the National Forest Inventory. Though the margin of error is primarily applicable to dataset B, this model applies the same margin of error across the matching variables for dataset A and B.

Source:

NFI. (2012). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"MOE_Growth_per_hectare_101-120" = 1

UNITS: dmnl

DOCUMENT: Definition:

Variable used to run simulations across a range of uncertainty. The exact margin of error is taken from the National Forest Inventory. Though the margin of error is primarily applicable to dataset B, this model applies the same margin of error across the matching variables for dataset A and B.

Source:

NFI. (2012). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"MOE_Growth_per_hectare_121-140" = 1

UNITS: dmnl

DOCUMENT: Definition:

Variable used to run simulations across a range of uncertainty. The exact margin of error is taken from the National Forest Inventory. Though the margin of error is primarily applicable to dataset B, this model applies the same margin of error across the matching variables for dataset A and B.

Source:

NFI. (2012). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"MOE_Growth_per_hectare_141-160" = 1

UNITS: dmnl

DOCUMENT: Definition:

Variable used to run simulations across a range of uncertainty. The exact margin of error is taken from the National Forest Inventory. Though the margin of error is primarily applicable to dataset B, this model applies the same margin of error across the matching variables for dataset A and B.

Source:

NFI. (2012). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"MOE_Growth_per_hectare_161-180" = 1

UNITS: dmnl

DOCUMENT: Definition:

Variable used to run simulations across a range of uncertainty. The exact margin of error is taken from the National Forest Inventory. Though the margin of error is primarily applicable to dataset B, this model applies the same margin of error across the matching variables for dataset A and B.

Source:

NFI. (2012). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

MOE_Growth_per_hectare_181_and_above = 1

UNITS: dmnl

DOCUMENT: Definition:

Variable used to run simulations across a range of uncertainty. The exact margin of error is taken from the National Forest Inventory. Though the margin of error is primarily applicable to dataset B, this model applies the same margin of error across the matching variables for dataset A and B.

Source:

NFI. (2012). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"MOE_Growth_per_hectare_21-40" = 1

UNITS: dmnl

DOCUMENT: Definition:

Variable used to run simulations across a range of uncertainty. The exact margin of error is taken from the National Forest Inventory. Though the margin of error is primarily applicable to dataset B, this model applies the same margin of error across the matching variables for dataset A and B.

Source:

NFI. (2012). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"MOE_Growth_per_hectare_41-60" = 1

UNITS: dmnl

DOCUMENT: Definition:

Variable used to run simulations across a range of uncertainty. The exact margin of error is taken from the National Forest Inventory. Though the margin of error is primarily applicable to dataset B, this model applies the same margin of error across the matching variables for dataset A and B.

Source:

NFI. (2012). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"MOE_Growth_per_hectare_61-80" = 1

UNITS: dmnl

DOCUMENT: Definition:

Variable used to run simulations across a range of uncertainty. The exact margin of error is taken from the National Forest Inventory. Though the margin of error is primarily applicable to dataset B, this model applies the same margin of error across the matching variables for dataset A and B.

Source:

NFI. (2012). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"MOE_Growth_per_hectare_81-100" = 1

UNITS: dmnl

DOCUMENT: Definition:

Variable used to run simulations across a range of uncertainty. The exact margin of error is taken from the National Forest Inventory. Though the margin of error is primarily applicable to dataset B, this model applies the same margin of error across the matching variables for dataset A and B.

Source:

NFI. (2012). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

Relative_average_density_of_forest_age_1_to_20 = Average_density_of_forest_age_1_to_20/
INIT(Average_density_of_forest_age_1_to_20)

UNITS: dmnl

DOCUMENT: Definition:

Relative density of the forest compared to the initial density of the forest (base initial year 2012). Used to determine the average density of forest passing from one stock to the next in the aging chain.

Relative_average_density_of_forest_age_101_to_120 =
Average_density_of_forest_age_101_to_120/INIT(Average_density_of_forest_age_101_to_120)

UNITS: dmnl

DOCUMENT: Definition:

Relative density of the forest compared to the initial density of the forest (base initial year 2012). Used to determine the average density of forest passing from one stock to the next in the aging chain.

Relative_average_density_of_forest_age_121_to_140 =
Average_density_of_forest_age_121_to_140/INIT(Average_density_of_forest_age_121_to_140)

UNITS: dmnl

DOCUMENT: Definition:

Relative density of the forest compared to the initial density of the forest (base initial year 2012).
Used to determine the average density of forest passing from one stock to the next in the aging chain.

Relative_average_density_of_forest_age_141_to_160 =

Average_density_of_forest_age_141_to_160/INIT(Average_density_of_forest_age_141_to_160)

UNITS: dmnl

DOCUMENT: Definition:

Relative density of the forest compared to the initial density of the forest (base initial year 2012).
Used to determine the average density of forest passing from one stock to the next in the aging chain.

Relative_average_density_of_forest_age_161_to_180 =

Average_density_of_forest_age_161_to_180/INIT(Average_density_of_forest_age_161_to_180)

UNITS: dmnl

DOCUMENT: Definition:

Relative density of the forest compared to the initial density of the forest (base initial year 2012).
Used to determine the average density of forest passing from one stock to the next in the aging chain.

Relative_average_density_of_forest_age_21_to_40 =

Average_density_of_forest_age_21_to_40/INIT(Average_density_of_forest_age_21_to_40)

UNITS: dmnl

DOCUMENT: Definition:

Relative density of the forest compared to the initial density of the forest (base initial year 2012).
Used to determine the average density of forest passing from one stock to the next in the aging chain.

Relative_average_density_of_forest_age_41_to_60 =

Average_density_of_forest_age_41_to_60/INIT(Average_density_of_forest_age_41_to_60)

UNITS: dmnl

DOCUMENT: Definition:

Relative density of the forest compared to the initial density of the forest (base initial year 2012).
Used to determine the average density of forest passing from one stock to the next in the aging chain.

Relative_average_density_of_forest_age_61_to_80 =

Average_density_of_forest_age_61_to_80/INIT(Average_density_of_forest_age_61_to_80)

UNITS: dmnl

DOCUMENT: Definition:

Relative density of the forest compared to the initial density of the forest (base initial year 2012).
Used to determine the average density of forest passing from one stock to the next in the aging chain.

Relative_average_density_of_forest_age_81_to_100 =

Average_density_of_forest_age_81_to_100/INIT(Average_density_of_forest_age_81_to_100)

UNITS: dmnl

DOCUMENT: Definition:

Relative density of the forest compared to the initial density of the forest (base initial year 2012).
Used to determine the average density of forest passing from one stock to the next in the aging chain.

Total_forest_area = Forest_area_age_1_to_20 + Forest_area_age_101_to_120 +

Forest_area_age_121_to_140 + Forest_area_age_141_to_160 + Forest_area_age_161_to_180 +

Forest_area_age_181_and_above + Forest_area_age_21_to_40 + Forest_area_age_41_to_60 +

Forest_area_age_61_to_80 + Forest_area_age_81_to_100

UNITS: Hectares

DOCUMENT: Definition:

The sum of all stock of forest areas.

Total_forest_area_regenerating = Forests_101_to_120_regenerating +

Forests_121_to_140_regenerating + Forests_141_to_160_regenerating +

Forests_161_to_180_regenerating + Forests_181_and_above_regenerating +
Forests_1_to_20_regenerating + Forests_21_to_40_regenerating + Forests_41_to_60_regenerating +
Forests_61_to_80_regenerating + Forests_81_to_100_regenerating

UNITS: Hectare/Year

DOCUMENT: SUM of all forest area regeneration.

Total_volume_of_wood = Volume_of_wood_in_forest_age_101_to_120 +
Volume_of_wood_in_forest_age_121_to_140 + Volume_of_wood_in_forest_age_141_to_160 +
Volume_of_wood_in_forest_age_161_to_180 + Volume_of_wood_in_forest_age_181_and_above +
Volume_of_wood_in_forest_age_1_to_20 + Volume_of_wood_in_forest_age_21_to_40 +
Volume_of_wood_in_forest_age_41_to_60 + Volume_of_wood_in_forest_age_61_to_80 +
Volume_of_wood_in_forest_age_81_to_100

UNITS: Cubic Meters

DOCUMENT: Definition:

Total volume of wood to be found across forests of all age groups in Romania.

Total_wood_extraction = "Extraction_of_wood_from_forest_age_1-20" +
"Extraction_of_wood_from_forest_age_101-120" + "Extraction_of_wood_from_forest_age_121-140" +
"Extraction_of_wood_from_forest_age_141-160" + "Extraction_of_wood_from_forest_age_161-180" +
"Extraction_of_wood_from_forest_age_21-40" + "Extraction_of_wood_from_forest_age_41-60" +
"Extraction_of_wood_from_forest_age_61-80" + "Extraction_of_wood_from_forest_age_81-100" +
Extraction_of_wood_from_forest_age_181_and_above

UNITS: Cubic Meter/Year

DOCUMENT: Definition:

The sum of wood extraction across all age groups.

Total_yield = "Growth_function_1-_20".Growth_within_stock + "Growth_function_101-
_120".Growth_within_stock + "Growth_function_121-_140".Growth_within_stock +
"Growth_function_141-_160".Growth_within_stock + "Growth_function_161-
_180".Growth_within_stock + "Growth_function_21-_40".Growth_within_stock +
"Growth_function_41-_60".Growth_within_stock + "Growth_function_61-_80".Growth_within_stock +
"Growth_function_81-_100".Growth_within_stock +
Growth_function_181_and_above.Growth_within_stock

UNITS: Cubic Meter/Year

DOCUMENT: Definition:

The purpose of the study is to understand what the total yield of Romania's forests currently is, and how it will evolve in the future. In the model it is the sum of 'forest growth' flows from all age groups.

Unit_of_measure_of_transit_time = 1

UNITS: Year

DOCUMENT: Variable used to maintain unit consistency in situations when referring to stocks in order to determine flows.

"Growth_function_1-_20":

"Growth_per_hectare_1-20_1" = 0

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_1-20_2" = 1.12911854

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_1-20_3" = 1.951653928

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_1-20_4" = 2.848013512

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_1-20_5" = 3.710204378

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_1-20_6" = 4.55907771

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_1-20_7" = 5.380042493

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_1-20_8" = 6.163163843

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

Growth_potential = (Maximum_density_of_forests_age_1_to_20-Model.Average_density_of_forest_age_1_to_20)*Model.Forest_area_age_1_to_20/Unit_of_measure_of_transit_time

UNITS: Cubic Meter/Year

DOCUMENT: Definition:

How much the forest can grow before it reaches maximum its maximum density.

Growth_within_stock = MIN(Growth_potential, "Growth_per_hectare_1-20_1" * (Model.Forest_area_age_1_to_20[160] + Model.Forest_area_age_1_to_20[159] + Model.Forest_area_age_1_to_20[158] + Model.Forest_area_age_1_to_20[157] + Model.Forest_area_age_1_to_20[156] + Model.Forest_area_age_1_to_20[155] + Model.Forest_area_age_1_to_20[154] + Model.Forest_area_age_1_to_20[153] + Model.Forest_area_age_1_to_20[152] + Model.Forest_area_age_1_to_20[151] + Model.Forest_area_age_1_to_20[150] + Model.Forest_area_age_1_to_20[149] + Model.Forest_area_age_1_to_20[148] + Model.Forest_area_age_1_to_20[147] + Model.Forest_area_age_1_to_20[146] + Model.Forest_area_age_1_to_20[145] +

Model.Forest_area_age_1_to_20[53] + Model.Forest_area_age_1_to_20[52] +
 Model.Forest_area_age_1_to_20[51] + Model.Forest_area_age_1_to_20[50] +
 Model.Forest_area_age_1_to_20[49] + Model.Forest_area_age_1_to_20[48] +
 Model.Forest_area_age_1_to_20[47] + Model.Forest_area_age_1_to_20[46] +
 Model.Forest_area_age_1_to_20[45] + Model.Forest_area_age_1_to_20[44] +
 Model.Forest_area_age_1_to_20[43] + Model.Forest_area_age_1_to_20[42] +
 Model.Forest_area_age_1_to_20[41]) + "Growth_per_hectare_1-20_7" *
 (Model.Forest_area_age_1_to_20[40] + Model.Forest_area_age_1_to_20[39] +
 Model.Forest_area_age_1_to_20[38] + Model.Forest_area_age_1_to_20[37] +
 Model.Forest_area_age_1_to_20[36] + Model.Forest_area_age_1_to_20[35] +
 Model.Forest_area_age_1_to_20[34] + Model.Forest_area_age_1_to_20[33] +
 Model.Forest_area_age_1_to_20[32] + Model.Forest_area_age_1_to_20[31] +
 Model.Forest_area_age_1_to_20[30] + Model.Forest_area_age_1_to_20[29] +
 Model.Forest_area_age_1_to_20[28] + Model.Forest_area_age_1_to_20[27] +
 Model.Forest_area_age_1_to_20[26] + Model.Forest_area_age_1_to_20[25] +
 Model.Forest_area_age_1_to_20[24] + Model.Forest_area_age_1_to_20[23] +
 Model.Forest_area_age_1_to_20[22] + Model.Forest_area_age_1_to_20[21]) +
 "Growth_per_hectare_1-20_8" * (Model.Forest_area_age_1_to_20[20] +
 Model.Forest_area_age_1_to_20[19] + Model.Forest_area_age_1_to_20[18] +
 Model.Forest_area_age_1_to_20[17] + Model.Forest_area_age_1_to_20[16] +
 Model.Forest_area_age_1_to_20[15] + Model.Forest_area_age_1_to_20[14] +
 Model.Forest_area_age_1_to_20[13] + Model.Forest_area_age_1_to_20[12] +
 Model.Forest_area_age_1_to_20[11] + Model.Forest_area_age_1_to_20[10] +
 Model.Forest_area_age_1_to_20[9] + Model.Forest_area_age_1_to_20[8] +
 Model.Forest_area_age_1_to_20[7] + Model.Forest_area_age_1_to_20[6] +
 Model.Forest_area_age_1_to_20[5] + Model.Forest_area_age_1_to_20[4] +
 Model.Forest_area_age_1_to_20[3] + Model.Forest_area_age_1_to_20[2] +
 Model.Forest_area_age_1_to_20[1]))

UNITS: Cubic Meter/Year

DOCUMENT: Definition:

Forest yield decomposed by age group. Each slat of the conveyor had to be addressed separately in order to obtain the output of a nonlinear function. Thus, trees from some slats contribute with more yield than trees from other slats.

Maximum_density_of_forests_age_1_to_20 =

Model.Initial_average_density_of_forest_age_20*Model.Maximum_forest_density_control

UNITS: Cubic Meters/Hectare

DOCUMENT: Definition:

The maximum density to which forests can grow by the age of 20. Calculated based on the initial density of forests aged 20.

Unit_of_measure_of_transit_time = 1

UNITS: Year

"Growth_function_101-120":

"Growth_per_hectare_101-120_1" = 8.944923545

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_101-120_2" = 8.906642828

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_101-120_3" = 8.865101877

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_101-120_4" = 8.820308355

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_101-120_5" = 8.771310302

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_101-120_6" = 8.71766812

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_101-120_7" = 8.658701401

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_101-120_8" = 8.59573481

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

Growth_potential = (Maximum_density_of_forests_age_100_to_120-Model.Average_density_of_forest_age_101_to_120)*Model.Forest_area_age_101_to_120/Unit_of_measure_of_transit_time

UNITS: Cubic Meter/Year

DOCUMENT: Definition:

How much the forest can grow before it reaches maximum its maximum density.

Growth_within_stock = MIN(Growth_potential, "Growth_per_hectare_101-120_1" * (Model.Forest_area_age_101_to_120[160] + Model.Forest_area_age_101_to_120[159] + Model.Forest_area_age_101_to_120[158] + Model.Forest_area_age_101_to_120[157] + Model.Forest_area_age_101_to_120[156] + Model.Forest_area_age_101_to_120[155] + Model.Forest_area_age_101_to_120[154] + Model.Forest_area_age_101_to_120[153] + Model.Forest_area_age_101_to_120[152] + Model.Forest_area_age_101_to_120[151] + Model.Forest_area_age_101_to_120[150] + Model.Forest_area_age_101_to_120[149] +

Model.Forest_area_age_101_to_120[57] + Model.Forest_area_age_101_to_120[56] +
 Model.Forest_area_age_101_to_120[55] + Model.Forest_area_age_101_to_120[54] +
 Model.Forest_area_age_101_to_120[53] + Model.Forest_area_age_101_to_120[52] +
 Model.Forest_area_age_101_to_120[51] + Model.Forest_area_age_101_to_120[50] +
 Model.Forest_area_age_101_to_120[49] + Model.Forest_area_age_101_to_120[48] +
 Model.Forest_area_age_101_to_120[47] + Model.Forest_area_age_101_to_120[46] +
 Model.Forest_area_age_101_to_120[45] + Model.Forest_area_age_101_to_120[44] +
 Model.Forest_area_age_101_to_120[43] + Model.Forest_area_age_101_to_120[42] +
 Model.Forest_area_age_101_to_120[41]) + "Growth_per_hectare_101-120_7" *
 (Model.Forest_area_age_101_to_120[40] + Model.Forest_area_age_101_to_120[39] +
 Model.Forest_area_age_101_to_120[38] + Model.Forest_area_age_101_to_120[37] +
 Model.Forest_area_age_101_to_120[36] + Model.Forest_area_age_101_to_120[35] +
 Model.Forest_area_age_101_to_120[34] + Model.Forest_area_age_101_to_120[33] +
 Model.Forest_area_age_101_to_120[32] + Model.Forest_area_age_101_to_120[31] +
 Model.Forest_area_age_101_to_120[30] + Model.Forest_area_age_101_to_120[29] +
 Model.Forest_area_age_101_to_120[28] + Model.Forest_area_age_101_to_120[27] +
 Model.Forest_area_age_101_to_120[26] + Model.Forest_area_age_101_to_120[25] +
 Model.Forest_area_age_101_to_120[24] + Model.Forest_area_age_101_to_120[23] +
 Model.Forest_area_age_101_to_120[22] + Model.Forest_area_age_101_to_120[21]) +
 "Growth_per_hectare_101-120_8" * (Model.Forest_area_age_101_to_120[20] +
 Model.Forest_area_age_101_to_120[19] + Model.Forest_area_age_101_to_120[18] +
 Model.Forest_area_age_101_to_120[17] + Model.Forest_area_age_101_to_120[16] +
 Model.Forest_area_age_101_to_120[15] + Model.Forest_area_age_101_to_120[14] +
 Model.Forest_area_age_101_to_120[13] + Model.Forest_area_age_101_to_120[12] +
 Model.Forest_area_age_101_to_120[11] + Model.Forest_area_age_101_to_120[10] +
 Model.Forest_area_age_101_to_120[9] + Model.Forest_area_age_101_to_120[8] +
 Model.Forest_area_age_101_to_120[7] + Model.Forest_area_age_101_to_120[6] +
 Model.Forest_area_age_101_to_120[5] + Model.Forest_area_age_101_to_120[4] +
 Model.Forest_area_age_101_to_120[3] + Model.Forest_area_age_101_to_120[2] +
 Model.Forest_area_age_101_to_120[1]))

UNITS: Cubic Meter/Year

DOCUMENT: Definition:

Forest yield decomposed by age group. Each slat of the conveyor had to be addressed separately in order to obtain the output of a nonlinear function. Thus, trees from some slats contribute with more yield than trees from other slats.

Maximum_density_of_forests_age_100_to_120 =

Model.Initial_average_density_of_forest_age_120*Model.Maximum_forest_density_control

UNITS: Cubic Meter/Hectare

DOCUMENT: Definition:

The maximum density to which forests can grow by the age of 120. Calculated based on the initial density of forests aged 120.

Unit_of_measure_of_transit_time = 1

UNITS: Year

"Growth_function_121-140":

"Growth_per_hectare_121-140_1" = 8.518075342

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_121-140_2" = 8.456621653

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_121-140_3" = 8.400630977

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_121-140_4" = 8.351547014

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_121-140_5" = 8.308924423

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_121-140_6" = 8.272569893

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_121-140_7" = 8.242172171

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_121-140_8" = 8.217251046

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

Growth_potential = (Maximum_density_of_forests_age_121_to_140-

Model.Average_density_of_forest_age_121_to_140)*Model.Forest_area_age_121_to_140/Unit_of_measure_of_transit_time

UNITS: Cubic Meter/Year

DOCUMENT: Definition:

How much the forest can grow before it reaches maximum its maximum density.

Growth_within_stock = MIN(Growth_potential, "Growth_per_hectare_121-140_1" * (Model.Forest_area_age_121_to_140[160] + Model.Forest_area_age_121_to_140[159] + Model.Forest_area_age_121_to_140[158] + Model.Forest_area_age_121_to_140[157] + Model.Forest_area_age_121_to_140[156] + Model.Forest_area_age_121_to_140[155] +

Model.Forest_area_age_121_to_140[62] + Model.Forest_area_age_121_to_140[61]) +
 "Growth_per_hectare_121-140_6" * (Model.Forest_area_age_121_to_140[60] +
 Model.Forest_area_age_121_to_140[59] + Model.Forest_area_age_121_to_140[58] +
 Model.Forest_area_age_121_to_140[57] + Model.Forest_area_age_121_to_140[56] +
 Model.Forest_area_age_121_to_140[55] + Model.Forest_area_age_121_to_140[54] +
 Model.Forest_area_age_121_to_140[53] + Model.Forest_area_age_121_to_140[52] +
 Model.Forest_area_age_121_to_140[51] + Model.Forest_area_age_121_to_140[50] +
 Model.Forest_area_age_121_to_140[49] + Model.Forest_area_age_121_to_140[48] +
 Model.Forest_area_age_121_to_140[47] + Model.Forest_area_age_121_to_140[46] +
 Model.Forest_area_age_121_to_140[45] + Model.Forest_area_age_121_to_140[44] +
 Model.Forest_area_age_121_to_140[43] + Model.Forest_area_age_121_to_140[42] +
 Model.Forest_area_age_121_to_140[41]) + "Growth_per_hectare_121-140_7" *
 (Model.Forest_area_age_121_to_140[40] + Model.Forest_area_age_121_to_140[39] +
 Model.Forest_area_age_121_to_140[38] + Model.Forest_area_age_121_to_140[37] +
 Model.Forest_area_age_121_to_140[36] + Model.Forest_area_age_121_to_140[35] +
 Model.Forest_area_age_121_to_140[34] + Model.Forest_area_age_121_to_140[33] +
 Model.Forest_area_age_121_to_140[32] + Model.Forest_area_age_121_to_140[31] +
 Model.Forest_area_age_121_to_140[30] + Model.Forest_area_age_121_to_140[29] +
 Model.Forest_area_age_121_to_140[28] + Model.Forest_area_age_121_to_140[27] +
 Model.Forest_area_age_121_to_140[26] + Model.Forest_area_age_121_to_140[25] +
 Model.Forest_area_age_121_to_140[24] + Model.Forest_area_age_121_to_140[23] +
 Model.Forest_area_age_121_to_140[22] + Model.Forest_area_age_121_to_140[21]) +
 "Growth_per_hectare_121-140_8" * (Model.Forest_area_age_121_to_140[20] +
 Model.Forest_area_age_121_to_140[19] + Model.Forest_area_age_121_to_140[18] +
 Model.Forest_area_age_121_to_140[17] + Model.Forest_area_age_121_to_140[16] +
 Model.Forest_area_age_121_to_140[15] + Model.Forest_area_age_121_to_140[14] +
 Model.Forest_area_age_121_to_140[13] + Model.Forest_area_age_121_to_140[12] +
 Model.Forest_area_age_121_to_140[11] + Model.Forest_area_age_121_to_140[10] +
 Model.Forest_area_age_121_to_140[9] + Model.Forest_area_age_121_to_140[8] +
 Model.Forest_area_age_121_to_140[7] + Model.Forest_area_age_121_to_140[6] +
 Model.Forest_area_age_121_to_140[5] + Model.Forest_area_age_121_to_140[4] +
 Model.Forest_area_age_121_to_140[3] + Model.Forest_area_age_121_to_140[2] +
 Model.Forest_area_age_121_to_140[1]))

UNITS: Cubic Meter/Year

DOCUMENT: Definition:

Forest yield decomposed by age group. Each slat of the conveyor had to be addressed separately in order to obtain the output of a nonlinear function. Thus, trees from some slats contribute with more yield than trees from other slats.

Maximum_density_of_forests_age_121_to_140 =

Model.Initial_average_density_of_forest_age_140*Model.Maximum_forest_density_control

UNITS: Cubic Meter/Hectare

DOCUMENT: Definition:

The maximum density to which forests can grow by the age of 140. Calculated based on the initial density of forests aged 140.

Unit_of_measure_of_transit_time = 1

UNITS: Year

"Growth_function_141-160":

"Growth_per_hectare_141-160_1" = 8.199412744

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_141-160_2" = 8.183895117

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_141-160_3" = 8.17264019

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_141-160_4" = 8.165702155

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_141-160_5" = 8.163383222

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_141-160_6" = 8.165742979

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_141-160_7" = 8.172937022

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_141-160_8" = 8.184081342

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

Growth_potential = (Maximum_density_of_forests_age_141_to_160-

Model.Average_density_of_forest_age_141_to_160)*Model.Forest_area_age_141_to_160/Unit_of_masure_of_transit_time

UNITS: Cubic Meter/Year

DOCUMENT: Definition:

How much the forest can grow before it reaches maximum its maximum density.

Model.Forest_area_age_141_to_160[70] + Model.Forest_area_age_141_to_160[69] +
 Model.Forest_area_age_141_to_160[68] + Model.Forest_area_age_141_to_160[67] +
 Model.Forest_area_age_141_to_160[66] + Model.Forest_area_age_141_to_160[65] +
 Model.Forest_area_age_141_to_160[64] + Model.Forest_area_age_141_to_160[63] +
 Model.Forest_area_age_141_to_160[62] + Model.Forest_area_age_141_to_160[61]) +
 "Growth_per_hectare_141-160_6" * (Model.Forest_area_age_141_to_160[60] +
 Model.Forest_area_age_141_to_160[59] + Model.Forest_area_age_141_to_160[58] +
 Model.Forest_area_age_141_to_160[57] + Model.Forest_area_age_141_to_160[56] +
 Model.Forest_area_age_141_to_160[55] + Model.Forest_area_age_141_to_160[54] +
 Model.Forest_area_age_141_to_160[53] + Model.Forest_area_age_141_to_160[52] +
 Model.Forest_area_age_141_to_160[51] + Model.Forest_area_age_141_to_160[50] +
 Model.Forest_area_age_141_to_160[49] + Model.Forest_area_age_141_to_160[48] +
 Model.Forest_area_age_141_to_160[47] + Model.Forest_area_age_141_to_160[46] +
 Model.Forest_area_age_141_to_160[45] + Model.Forest_area_age_141_to_160[44] +
 Model.Forest_area_age_141_to_160[43] + Model.Forest_area_age_141_to_160[42] +
 Model.Forest_area_age_141_to_160[41]) + "Growth_per_hectare_141-160_7" *
 (Model.Forest_area_age_141_to_160[40] + Model.Forest_area_age_141_to_160[39] +
 Model.Forest_area_age_141_to_160[38] + Model.Forest_area_age_141_to_160[37] +
 Model.Forest_area_age_141_to_160[36] + Model.Forest_area_age_141_to_160[35] +
 Model.Forest_area_age_141_to_160[34] + Model.Forest_area_age_141_to_160[33] +
 Model.Forest_area_age_141_to_160[32] + Model.Forest_area_age_141_to_160[31] +
 Model.Forest_area_age_141_to_160[30] + Model.Forest_area_age_141_to_160[29] +
 Model.Forest_area_age_141_to_160[28] + Model.Forest_area_age_141_to_160[27] +
 Model.Forest_area_age_141_to_160[26] + Model.Forest_area_age_141_to_160[25] +
 Model.Forest_area_age_141_to_160[24] + Model.Forest_area_age_141_to_160[23] +
 Model.Forest_area_age_141_to_160[22] + Model.Forest_area_age_141_to_160[21]) +
 "Growth_per_hectare_141-160_8" * (Model.Forest_area_age_141_to_160[20] +
 Model.Forest_area_age_141_to_160[19] + Model.Forest_area_age_141_to_160[18] +
 Model.Forest_area_age_141_to_160[17] + Model.Forest_area_age_141_to_160[16] +
 Model.Forest_area_age_141_to_160[15] + Model.Forest_area_age_141_to_160[14] +
 Model.Forest_area_age_141_to_160[13] + Model.Forest_area_age_141_to_160[12] +
 Model.Forest_area_age_141_to_160[11] + Model.Forest_area_age_141_to_160[10] +
 Model.Forest_area_age_141_to_160[9] + Model.Forest_area_age_141_to_160[8] +
 Model.Forest_area_age_141_to_160[7] + Model.Forest_area_age_141_to_160[6] +
 Model.Forest_area_age_141_to_160[5] + Model.Forest_area_age_141_to_160[4] +
 Model.Forest_area_age_141_to_160[3] + Model.Forest_area_age_141_to_160[2] +
 Model.Forest_area_age_141_to_160[1]))

UNITS: Cubic Meter/Year

DOCUMENT: Definition:

Forest yield decomposed by age group. Each slat of the conveyor had to be addressed separately in order to obtain the output of a nonlinear function. Thus, trees from some slats contribute with more yield than trees from other slats.

Maximum_density_of_forests_age_141_to_160 =

Model.Initial_average_density_of_forest_age_160*Model.Maximum_forest_density_control

UNITS: Cubic Meters/Hectare

DOCUMENT: Definition:

The maximum density to which forests can grow by the age of 160. Calculated based on the initial density of forests aged 160.

Unit_of_measure_of_transit_time = 1
UNITS: Year

"Growth_function_161-180":

"Growth_per_hectare_161-180_1" = 8.204684061
UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_161-180_2" = 8.218341666
UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_161-180_3" = 8.230584696
UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_161-180_4" = 8.240585677
UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_161-180_5" = 8.248551065

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_161-180_6" = 8.254592949

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_161-180_7" = 8.258985906

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_161-180_8" = 8.262036747

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

Growth_potential = (Maximum_density_of_forests_age_160_to_180-

Model.Average_density_of_forest_age_161_to_180)*Model.Forest_area_age_161_to_180/Unit_of_mea-
asure_of_transit_time

UNITS: Cubic Meter/Year

DOCUMENT: Definition:

How much the forest can grow before it reaches maximum its maximum density.

Growth_within_stock = MIN(Growth_potential, "Growth_per_hectare_161-180_1" *
(Model.Forest_area_age_161_to_180[160] + Model.Forest_area_age_161_to_180[159] +
Model.Forest_area_age_161_to_180[158] + Model.Forest_area_age_161_to_180[157] +
Model.Forest_area_age_161_to_180[156] + Model.Forest_area_age_161_to_180[155] +
Model.Forest_area_age_161_to_180[154] + Model.Forest_area_age_161_to_180[153] +
Model.Forest_area_age_161_to_180[152] + Model.Forest_area_age_161_to_180[151] +
Model.Forest_area_age_161_to_180[150] + Model.Forest_area_age_161_to_180[149] +
Model.Forest_area_age_161_to_180[148] + Model.Forest_area_age_161_to_180[147] +
Model.Forest_area_age_161_to_180[146] + Model.Forest_area_age_161_to_180[145] +
Model.Forest_area_age_161_to_180[144] + Model.Forest_area_age_161_to_180[143] +
Model.Forest_area_age_161_to_180[142] + Model.Forest_area_age_161_to_180[141]) +
"Growth_per_hectare_161-180_2" * (Model.Forest_area_age_161_to_180[140] +
Model.Forest_area_age_161_to_180[139] + Model.Forest_area_age_161_to_180[138] +
Model.Forest_area_age_161_to_180[137] + Model.Forest_area_age_161_to_180[136] +
Model.Forest_area_age_161_to_180[135] + Model.Forest_area_age_161_to_180[134] +
Model.Forest_area_age_161_to_180[133] + Model.Forest_area_age_161_to_180[132] +
Model.Forest_area_age_161_to_180[131] + Model.Forest_area_age_161_to_180[130] +
Model.Forest_area_age_161_to_180[129] + Model.Forest_area_age_161_to_180[128] +
Model.Forest_area_age_161_to_180[127] + Model.Forest_area_age_161_to_180[126] +
Model.Forest_area_age_161_to_180[125] + Model.Forest_area_age_161_to_180[124] +
Model.Forest_area_age_161_to_180[123] + Model.Forest_area_age_161_to_180[122] +
Model.Forest_area_age_161_to_180[121]) + "Growth_per_hectare_161-180_3" *
(Model.Forest_area_age_161_to_180[120] + Model.Forest_area_age_161_to_180[119] +
Model.Forest_area_age_161_to_180[118] + Model.Forest_area_age_161_to_180[117] +
Model.Forest_area_age_161_to_180[116] + Model.Forest_area_age_161_to_180[115] +
Model.Forest_area_age_161_to_180[114] + Model.Forest_area_age_161_to_180[113] +
Model.Forest_area_age_161_to_180[112] + Model.Forest_area_age_161_to_180[111] +
Model.Forest_area_age_161_to_180[110] + Model.Forest_area_age_161_to_180[109] +
Model.Forest_area_age_161_to_180[108] + Model.Forest_area_age_161_to_180[107] +
Model.Forest_area_age_161_to_180[106] + Model.Forest_area_age_161_to_180[105] +
Model.Forest_area_age_161_to_180[104] + Model.Forest_area_age_161_to_180[103] +
Model.Forest_area_age_161_to_180[102] + Model.Forest_area_age_161_to_180[101]) +
"Growth_per_hectare_161-180_4" * (Model.Forest_area_age_161_to_180[100] +
Model.Forest_area_age_161_to_180[99] + Model.Forest_area_age_161_to_180[98] +
Model.Forest_area_age_161_to_180[97] + Model.Forest_area_age_161_to_180[96] +
Model.Forest_area_age_161_to_180[95] + Model.Forest_area_age_161_to_180[94] +
Model.Forest_area_age_161_to_180[93] + Model.Forest_area_age_161_to_180[92] +
Model.Forest_area_age_161_to_180[91] + Model.Forest_area_age_161_to_180[90] +
Model.Forest_area_age_161_to_180[89] + Model.Forest_area_age_161_to_180[88] +
Model.Forest_area_age_161_to_180[87] + Model.Forest_area_age_161_to_180[86] +
Model.Forest_area_age_161_to_180[85] + Model.Forest_area_age_161_to_180[84] +
Model.Forest_area_age_161_to_180[83] + Model.Forest_area_age_161_to_180[82] +
Model.Forest_area_age_161_to_180[81]) + "Growth_per_hectare_161-180_5" *
(Model.Forest_area_age_161_to_180[80] + Model.Forest_area_age_161_to_180[79] +
Model.Forest_area_age_161_to_180[78] + Model.Forest_area_age_161_to_180[77] +
Model.Forest_area_age_161_to_180[76] + Model.Forest_area_age_161_to_180[75] +

Model.Forest_area_age_161_to_180[74] + Model.Forest_area_age_161_to_180[73] +
 Model.Forest_area_age_161_to_180[72] + Model.Forest_area_age_161_to_180[71] +
 Model.Forest_area_age_161_to_180[70] + Model.Forest_area_age_161_to_180[69] +
 Model.Forest_area_age_161_to_180[68] + Model.Forest_area_age_161_to_180[67] +
 Model.Forest_area_age_161_to_180[66] + Model.Forest_area_age_161_to_180[65] +
 Model.Forest_area_age_161_to_180[64] + Model.Forest_area_age_161_to_180[63] +
 Model.Forest_area_age_161_to_180[62] + Model.Forest_area_age_161_to_180[61]) +
 "Growth_per_hectare_161-180_6" * (Model.Forest_area_age_161_to_180[60] +
 Model.Forest_area_age_161_to_180[59] + Model.Forest_area_age_161_to_180[58] +
 Model.Forest_area_age_161_to_180[57] + Model.Forest_area_age_161_to_180[56] +
 Model.Forest_area_age_161_to_180[55] + Model.Forest_area_age_161_to_180[54] +
 Model.Forest_area_age_161_to_180[53] + Model.Forest_area_age_161_to_180[52] +
 Model.Forest_area_age_161_to_180[51] + Model.Forest_area_age_161_to_180[50] +
 Model.Forest_area_age_161_to_180[49] + Model.Forest_area_age_161_to_180[48] +
 Model.Forest_area_age_161_to_180[47] + Model.Forest_area_age_161_to_180[46] +
 Model.Forest_area_age_161_to_180[45] + Model.Forest_area_age_161_to_180[44] +
 Model.Forest_area_age_161_to_180[43] + Model.Forest_area_age_161_to_180[42] +
 Model.Forest_area_age_161_to_180[41]) + "Growth_per_hectare_161-180_7" *
 (Model.Forest_area_age_161_to_180[40] + Model.Forest_area_age_161_to_180[39] +
 Model.Forest_area_age_161_to_180[38] + Model.Forest_area_age_161_to_180[37] +
 Model.Forest_area_age_161_to_180[36] + Model.Forest_area_age_161_to_180[35] +
 Model.Forest_area_age_161_to_180[34] + Model.Forest_area_age_161_to_180[33] +
 Model.Forest_area_age_161_to_180[32] + Model.Forest_area_age_161_to_180[31] +
 Model.Forest_area_age_161_to_180[30] + Model.Forest_area_age_161_to_180[29] +
 Model.Forest_area_age_161_to_180[28] + Model.Forest_area_age_161_to_180[27] +
 Model.Forest_area_age_161_to_180[26] + Model.Forest_area_age_161_to_180[25] +
 Model.Forest_area_age_161_to_180[24] + Model.Forest_area_age_161_to_180[23] +
 Model.Forest_area_age_161_to_180[22] + Model.Forest_area_age_161_to_180[21]) +
 "Growth_per_hectare_161-180_8" * (Model.Forest_area_age_161_to_180[20] +
 Model.Forest_area_age_161_to_180[19] + Model.Forest_area_age_161_to_180[18] +
 Model.Forest_area_age_161_to_180[17] + Model.Forest_area_age_161_to_180[16] +
 Model.Forest_area_age_161_to_180[15] + Model.Forest_area_age_161_to_180[14] +
 Model.Forest_area_age_161_to_180[13] + Model.Forest_area_age_161_to_180[12] +
 Model.Forest_area_age_161_to_180[11] + Model.Forest_area_age_161_to_180[10] +
 Model.Forest_area_age_161_to_180[9] + Model.Forest_area_age_161_to_180[8] +
 Model.Forest_area_age_161_to_180[7] + Model.Forest_area_age_161_to_180[6] +
 Model.Forest_area_age_161_to_180[5] + Model.Forest_area_age_161_to_180[4] +
 Model.Forest_area_age_161_to_180[3] + Model.Forest_area_age_161_to_180[2] +
 Model.Forest_area_age_161_to_180[1]))

UNITS: Cubic Meter/Year

DOCUMENT: Definition:

Forest yield decomposed by age group. Each slat of the conveyor had to be addressed separately in order to obtain the output of a nonlinear function. Thus, trees from some slats contribute with more yield than trees from other slats.

Maximum_density_of_forests_age_160_to_180 =

Model.Initial_average_density_of_forest_age_180*Model.Maximum_forest_density_control

UNITS: Cubic Meters/Hectare

DOCUMENT: Definition:

The maximum density to which forests can grow by the age of 180. Calculated based on the initial density of forests aged 180.

Unit_of_measure_of_transit_time = 1

UNITS: Year

Growth_function_181_and_above:

Adjusted_maximum_density_of_old_growth_forests =

Maximum_density_of_old_growth_forests*Model.Maximum_forest_density_control

UNITS: Cubic Meter/Hectare

DOCUMENT: Definition:

The maximum density to which forests can grow.

Growth_per_hectare_181_and_above = 8.266225965

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

Growth_potential = (Adjusted_maximum_density_of_old_growth_forests-

Model.Average_density_of_forest_age_181_and_above)*Model.Forest_area_age_181_and_above/Unit_of_measure_of_transit_time

UNITS: Cubic Meter/Year

DOCUMENT: Definition:

How much the forest can grow before it reaches maximum its maximum density.

Growth_within_stock =

MIN(Growth_per_hectare_181_and_above*Model.Forest_area_age_181_and_above, Growth_potential)

UNITS: Cubic Meter/Year

DOCUMENT: Definition:

Forest yield decomposed by age group. Each slat of the conveyor had to be addressed separately in order to obtain the output of a nonlinear function. Thus, trees from some slats contribute with more yield than trees from other slats.

Maximum_density_of_old_growth_forests = 561.8646219

UNITS: Cubic Meter/Hectare

DOCUMENT: Definition:

Final value from the density curve calculated based on data from NFI. See Annex C.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

Unit_of_measure_of_transit_time = 1

UNITS: Year

"Growth_function_21-_40":

"Growth_per_hectare_21-40_1" = 6.92316163

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_21-40_2" = 7.587458848

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_21-40_3" = 8.172030817

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_21-40_4" = 8.672532259

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_21-40_5" = 9.091780212

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_21-40_6" = 9.434184224

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_21-40_7" = 9.702607099

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_21-40_8" = 9.905033663

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

Growth_potential = (Maximum_density_of_forests_age_21_to_40-

Model.Average_density_of_forest_age_21_to_40)*Model.Forest_area_age_21_to_40/Unit_of_measurement_of_transit_time

UNITS: Cubic Meter/Year

DOCUMENT: Definition:

How much the forest can grow before it reaches maximum its maximum density.

Model.Forest_area_age_21_to_40[70] + Model.Forest_area_age_21_to_40[69] +
 Model.Forest_area_age_21_to_40[68] + Model.Forest_area_age_21_to_40[67] +
 Model.Forest_area_age_21_to_40[66] + Model.Forest_area_age_21_to_40[65] +
 Model.Forest_area_age_21_to_40[64] + Model.Forest_area_age_21_to_40[63] +
 Model.Forest_area_age_21_to_40[62] + Model.Forest_area_age_21_to_40[61]) +
 "Growth_per_hectare_21-40_6" * (Model.Forest_area_age_21_to_40[60] +
 Model.Forest_area_age_21_to_40[59] + Model.Forest_area_age_21_to_40[58] +
 Model.Forest_area_age_21_to_40[57] + Model.Forest_area_age_21_to_40[56] +
 Model.Forest_area_age_21_to_40[55] + Model.Forest_area_age_21_to_40[54] +
 Model.Forest_area_age_21_to_40[53] + Model.Forest_area_age_21_to_40[52] +
 Model.Forest_area_age_21_to_40[51] + Model.Forest_area_age_21_to_40[50] +
 Model.Forest_area_age_21_to_40[49] + Model.Forest_area_age_21_to_40[48] +
 Model.Forest_area_age_21_to_40[47] + Model.Forest_area_age_21_to_40[46] +
 Model.Forest_area_age_21_to_40[45] + Model.Forest_area_age_21_to_40[44] +
 Model.Forest_area_age_21_to_40[43] + Model.Forest_area_age_21_to_40[42] +
 Model.Forest_area_age_21_to_40[41]) + "Growth_per_hectare_21-40_7" *
 (Model.Forest_area_age_21_to_40[40] + Model.Forest_area_age_21_to_40[39] +
 Model.Forest_area_age_21_to_40[38] + Model.Forest_area_age_21_to_40[37] +
 Model.Forest_area_age_21_to_40[36] + Model.Forest_area_age_21_to_40[35] +
 Model.Forest_area_age_21_to_40[34] + Model.Forest_area_age_21_to_40[33] +
 Model.Forest_area_age_21_to_40[32] + Model.Forest_area_age_21_to_40[31] +
 Model.Forest_area_age_21_to_40[30] + Model.Forest_area_age_21_to_40[29] +
 Model.Forest_area_age_21_to_40[28] + Model.Forest_area_age_21_to_40[27] +
 Model.Forest_area_age_21_to_40[26] + Model.Forest_area_age_21_to_40[25] +
 Model.Forest_area_age_21_to_40[24] + Model.Forest_area_age_21_to_40[23] +
 Model.Forest_area_age_21_to_40[22] + Model.Forest_area_age_21_to_40[21]) +
 "Growth_per_hectare_21-40_8" * (Model.Forest_area_age_21_to_40[20] +
 Model.Forest_area_age_21_to_40[19] + Model.Forest_area_age_21_to_40[18] +
 Model.Forest_area_age_21_to_40[17] + Model.Forest_area_age_21_to_40[16] +
 Model.Forest_area_age_21_to_40[15] + Model.Forest_area_age_21_to_40[14] +
 Model.Forest_area_age_21_to_40[13] + Model.Forest_area_age_21_to_40[12] +
 Model.Forest_area_age_21_to_40[11] + Model.Forest_area_age_21_to_40[10] +
 Model.Forest_area_age_21_to_40[9] + Model.Forest_area_age_21_to_40[8] +
 Model.Forest_area_age_21_to_40[7] + Model.Forest_area_age_21_to_40[6] +
 Model.Forest_area_age_21_to_40[5] + Model.Forest_area_age_21_to_40[4] +
 Model.Forest_area_age_21_to_40[3] + Model.Forest_area_age_21_to_40[2] +
 Model.Forest_area_age_21_to_40[1]))

UNITS: Cubic Meter/Year

DOCUMENT: Definition:

Forest yield decomposed by age group. Each slat of the conveyor had to be addressed separately in order to obtain the output of a nonlinear function. Thus, trees from some slats contribute with more yield than trees from other slats.

Maximum_density_of_forests_age_21_to_40 =

Model.Initial_average_density_of_forest_age_40*Model.Maximum_forest_density_control

UNITS: Cubic Meters/Hectare

DOCUMENT: Definition:

The maximum density to which forests can grow by the age of 40. Calculated based on the initial density of forests aged 40.

Unit_of_measure_of_transit_time = 1

UNITS: Year

"Growth_function_41-60":

"Growth_per_hectare_41-60_1" = 9.99393861

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_41-60_2" = 10.09580358

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_41-60_3" = 10.15907046

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_41-60_4" = 10.18337965

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_41-60_5" = 10.16162814

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_41-60_6" = 10.0909227

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_41-60_7" = 9.966625151

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_41-60_8" = 9.799046666

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

Growth_potential = (Maximum_density_of_forests_age_41_to_60-

Model.Average_density_of_forest_age_41_to_60)*Model.Forest_area_age_41_to_60/Unit_of_measure_of_transit_time

UNITS: Cubic Meter/Year

DOCUMENT: Definition:

How much the forest can grow before it reaches maximum its maximum density.

Growth_within_stock = MIN(Growth_potential, "Growth_per_hectare_41-60_1" * (Model.Forest_area_age_41_to_60[160] + Model.Forest_area_age_41_to_60[159] + Model.Forest_area_age_41_to_60[158] + Model.Forest_area_age_41_to_60[157] + Model.Forest_area_age_41_to_60[156] + Model.Forest_area_age_41_to_60[155] + Model.Forest_area_age_41_to_60[154] + Model.Forest_area_age_41_to_60[153] + Model.Forest_area_age_41_to_60[152] + Model.Forest_area_age_41_to_60[151] + Model.Forest_area_age_41_to_60[150] + Model.Forest_area_age_41_to_60[149] + Model.Forest_area_age_41_to_60[148] + Model.Forest_area_age_41_to_60[147] + Model.Forest_area_age_41_to_60[146] + Model.Forest_area_age_41_to_60[145] + Model.Forest_area_age_41_to_60[144] + Model.Forest_area_age_41_to_60[143] + Model.Forest_area_age_41_to_60[142] + Model.Forest_area_age_41_to_60[141]) + "Growth_per_hectare_41-60_2" * (Model.Forest_area_age_41_to_60[140] + Model.Forest_area_age_41_to_60[139] + Model.Forest_area_age_41_to_60[138] + Model.Forest_area_age_41_to_60[137] + Model.Forest_area_age_41_to_60[136] + Model.Forest_area_age_41_to_60[135] + Model.Forest_area_age_41_to_60[134] + Model.Forest_area_age_41_to_60[133] + Model.Forest_area_age_41_to_60[132] + Model.Forest_area_age_41_to_60[131] + Model.Forest_area_age_41_to_60[130] + Model.Forest_area_age_41_to_60[129] + Model.Forest_area_age_41_to_60[128] + Model.Forest_area_age_41_to_60[127] + Model.Forest_area_age_41_to_60[126] + Model.Forest_area_age_41_to_60[125] + Model.Forest_area_age_41_to_60[124] + Model.Forest_area_age_41_to_60[123] + Model.Forest_area_age_41_to_60[122] + Model.Forest_area_age_41_to_60[121]) + "Growth_per_hectare_41-60_3" * (Model.Forest_area_age_41_to_60[120] + Model.Forest_area_age_41_to_60[119] + Model.Forest_area_age_41_to_60[118] + Model.Forest_area_age_41_to_60[117] + Model.Forest_area_age_41_to_60[116] + Model.Forest_area_age_41_to_60[115] + Model.Forest_area_age_41_to_60[114] + Model.Forest_area_age_41_to_60[113] + Model.Forest_area_age_41_to_60[112] + Model.Forest_area_age_41_to_60[111] + Model.Forest_area_age_41_to_60[110] + Model.Forest_area_age_41_to_60[109] + Model.Forest_area_age_41_to_60[108] + Model.Forest_area_age_41_to_60[107] + Model.Forest_area_age_41_to_60[106] + Model.Forest_area_age_41_to_60[105] + Model.Forest_area_age_41_to_60[104] + Model.Forest_area_age_41_to_60[103] + Model.Forest_area_age_41_to_60[102] + Model.Forest_area_age_41_to_60[101]) + "Growth_per_hectare_41-60_4" * (Model.Forest_area_age_41_to_60[100] + Model.Forest_area_age_41_to_60[99] + Model.Forest_area_age_41_to_60[98] + Model.Forest_area_age_41_to_60[97] + Model.Forest_area_age_41_to_60[96] + Model.Forest_area_age_41_to_60[95] + Model.Forest_area_age_41_to_60[94] + Model.Forest_area_age_41_to_60[93] + Model.Forest_area_age_41_to_60[92] + Model.Forest_area_age_41_to_60[91] + Model.Forest_area_age_41_to_60[90] + Model.Forest_area_age_41_to_60[89] + Model.Forest_area_age_41_to_60[88] + Model.Forest_area_age_41_to_60[87] + Model.Forest_area_age_41_to_60[86] + Model.Forest_area_age_41_to_60[85] + Model.Forest_area_age_41_to_60[84] + Model.Forest_area_age_41_to_60[83] + Model.Forest_area_age_41_to_60[82] + Model.Forest_area_age_41_to_60[81]) + "Growth_per_hectare_41-60_5" * (Model.Forest_area_age_41_to_60[80] + Model.Forest_area_age_41_to_60[79] + Model.Forest_area_age_41_to_60[78] + Model.Forest_area_age_41_to_60[77] + Model.Forest_area_age_41_to_60[76] + Model.Forest_area_age_41_to_60[75] +

Model.Forest_area_age_41_to_60[74] + Model.Forest_area_age_41_to_60[73] +
 Model.Forest_area_age_41_to_60[72] + Model.Forest_area_age_41_to_60[71] +
 Model.Forest_area_age_41_to_60[70] + Model.Forest_area_age_41_to_60[69] +
 Model.Forest_area_age_41_to_60[68] + Model.Forest_area_age_41_to_60[67] +
 Model.Forest_area_age_41_to_60[66] + Model.Forest_area_age_41_to_60[65] +
 Model.Forest_area_age_41_to_60[64] + Model.Forest_area_age_41_to_60[63] +
 Model.Forest_area_age_41_to_60[62] + Model.Forest_area_age_41_to_60[61]) +
 "Growth_per_hectare_41-60_6" * (Model.Forest_area_age_41_to_60[60] +
 Model.Forest_area_age_41_to_60[59] + Model.Forest_area_age_41_to_60[58] +
 Model.Forest_area_age_41_to_60[57] + Model.Forest_area_age_41_to_60[56] +
 Model.Forest_area_age_41_to_60[55] + Model.Forest_area_age_41_to_60[54] +
 Model.Forest_area_age_41_to_60[53] + Model.Forest_area_age_41_to_60[52] +
 Model.Forest_area_age_41_to_60[51] + Model.Forest_area_age_41_to_60[50] +
 Model.Forest_area_age_41_to_60[49] + Model.Forest_area_age_41_to_60[48] +
 Model.Forest_area_age_41_to_60[47] + Model.Forest_area_age_41_to_60[46] +
 Model.Forest_area_age_41_to_60[45] + Model.Forest_area_age_41_to_60[44] +
 Model.Forest_area_age_41_to_60[43] + Model.Forest_area_age_41_to_60[42] +
 Model.Forest_area_age_41_to_60[41]) + "Growth_per_hectare_41-60_7" *
 (Model.Forest_area_age_41_to_60[40] + Model.Forest_area_age_41_to_60[39] +
 Model.Forest_area_age_41_to_60[38] + Model.Forest_area_age_41_to_60[37] +
 Model.Forest_area_age_41_to_60[36] + Model.Forest_area_age_41_to_60[35] +
 Model.Forest_area_age_41_to_60[34] + Model.Forest_area_age_41_to_60[33] +
 Model.Forest_area_age_41_to_60[32] + Model.Forest_area_age_41_to_60[31] +
 Model.Forest_area_age_41_to_60[30] + Model.Forest_area_age_41_to_60[29] +
 Model.Forest_area_age_41_to_60[28] + Model.Forest_area_age_41_to_60[27] +
 Model.Forest_area_age_41_to_60[26] + Model.Forest_area_age_41_to_60[25] +
 Model.Forest_area_age_41_to_60[24] + Model.Forest_area_age_41_to_60[23] +
 Model.Forest_area_age_41_to_60[22] + Model.Forest_area_age_41_to_60[21]) +
 "Growth_per_hectare_41-60_8" * (Model.Forest_area_age_41_to_60[20] +
 Model.Forest_area_age_41_to_60[19] + Model.Forest_area_age_41_to_60[18] +
 Model.Forest_area_age_41_to_60[17] + Model.Forest_area_age_41_to_60[16] +
 Model.Forest_area_age_41_to_60[15] + Model.Forest_area_age_41_to_60[14] +
 Model.Forest_area_age_41_to_60[13] + Model.Forest_area_age_41_to_60[12] +
 Model.Forest_area_age_41_to_60[11] + Model.Forest_area_age_41_to_60[10] +
 Model.Forest_area_age_41_to_60[9] + Model.Forest_area_age_41_to_60[8] +
 Model.Forest_area_age_41_to_60[7] + Model.Forest_area_age_41_to_60[6] +
 Model.Forest_area_age_41_to_60[5] + Model.Forest_area_age_41_to_60[4] +
 Model.Forest_area_age_41_to_60[3] + Model.Forest_area_age_41_to_60[2] +
 Model.Forest_area_age_41_to_60[1]))

UNITS: Cubic Meter/Year

DOCUMENT: Definition:

Forest yield decomposed by age group. Each slat of the conveyor had to be addressed separately in order to obtain the output of a nonlinear function. Thus, trees from some slats contribute with more yield than trees from other slats.

Maximum_density_of_forests_age_41_to_60 =

Model.Initial_average_density_of_forest_age_60*Model.Maximum_forest_density_control

UNITS: Cubic Meters/Hectare

DOCUMENT: Definition:

The maximum density to which forests can grow by the age of 60. Calculated based on the initial density of forests aged 60.

Unit_of_measure_of_transit_time = 1

UNITS: Year

"Growth_function_61-80":

"Growth_per_hectare_61-80_1" = 9.507545557

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_61-80_2" = 9.325536904

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_61-80_3" = 9.170066607

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_61-80_4" = 9.051652548

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_61-80_5" = 8.967487294

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_61-80_6" = 8.917006273

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_61-80_7" = 8.900305289

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_61-80_8" = 8.910949058

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

Growth_potential = (Maximum_density_of_forests_age_61_to_80-
Model.Average_density_of_forest_age_61_to_80)*Model.Forest_area_age_61_to_80/Unit_of_measur
e_of_transit_time

UNITS: Cubic Meter/Year

DOCUMENT: Definition:

How much the forest can grow before it reaches maximum its maximum density.

Growth_within_stock = MIN(Growth_potential, "Growth_per_hectare_61-80_1" *
(Model.Forest_area_age_61_to_80[160] + Model.Forest_area_age_61_to_80[159] +
Model.Forest_area_age_61_to_80[158] + Model.Forest_area_age_61_to_80[157] +
Model.Forest_area_age_61_to_80[156] + Model.Forest_area_age_61_to_80[155] +
Model.Forest_area_age_61_to_80[154] + Model.Forest_area_age_61_to_80[153] +
Model.Forest_area_age_61_to_80[152] + Model.Forest_area_age_61_to_80[151] +
Model.Forest_area_age_61_to_80[150] + Model.Forest_area_age_61_to_80[149] +
Model.Forest_area_age_61_to_80[148] + Model.Forest_area_age_61_to_80[147] +
Model.Forest_area_age_61_to_80[146] + Model.Forest_area_age_61_to_80[145] +
Model.Forest_area_age_61_to_80[144] + Model.Forest_area_age_61_to_80[143] +
Model.Forest_area_age_61_to_80[142] + Model.Forest_area_age_61_to_80[141]) +
"Growth_per_hectare_61-80_2" * (Model.Forest_area_age_61_to_80[140] +
Model.Forest_area_age_61_to_80[139] + Model.Forest_area_age_61_to_80[138] +
Model.Forest_area_age_61_to_80[137] + Model.Forest_area_age_61_to_80[136] +
Model.Forest_area_age_61_to_80[135] + Model.Forest_area_age_61_to_80[134] +
Model.Forest_area_age_61_to_80[133] + Model.Forest_area_age_61_to_80[132] +
Model.Forest_area_age_61_to_80[131] + Model.Forest_area_age_61_to_80[130] +
Model.Forest_area_age_61_to_80[129] + Model.Forest_area_age_61_to_80[128] +
Model.Forest_area_age_61_to_80[127] + Model.Forest_area_age_61_to_80[126] +
Model.Forest_area_age_61_to_80[125] + Model.Forest_area_age_61_to_80[124] +
Model.Forest_area_age_61_to_80[123] + Model.Forest_area_age_61_to_80[122] +
Model.Forest_area_age_61_to_80[121]) + "Growth_per_hectare_61-80_3" *
(Model.Forest_area_age_61_to_80[120] + Model.Forest_area_age_61_to_80[119] +
Model.Forest_area_age_61_to_80[118] + Model.Forest_area_age_61_to_80[117] +
Model.Forest_area_age_61_to_80[116] + Model.Forest_area_age_61_to_80[115] +
Model.Forest_area_age_61_to_80[114] + Model.Forest_area_age_61_to_80[113] +
Model.Forest_area_age_61_to_80[112] + Model.Forest_area_age_61_to_80[111] +
Model.Forest_area_age_61_to_80[110] + Model.Forest_area_age_61_to_80[109] +
Model.Forest_area_age_61_to_80[108] + Model.Forest_area_age_61_to_80[107] +
Model.Forest_area_age_61_to_80[106] + Model.Forest_area_age_61_to_80[105] +
Model.Forest_area_age_61_to_80[104] + Model.Forest_area_age_61_to_80[103] +
Model.Forest_area_age_61_to_80[102] + Model.Forest_area_age_61_to_80[101]) +
"Growth_per_hectare_61-80_4" * (Model.Forest_area_age_61_to_80[100] +
Model.Forest_area_age_61_to_80[99] + Model.Forest_area_age_61_to_80[98] +
Model.Forest_area_age_61_to_80[97] + Model.Forest_area_age_61_to_80[96] +
Model.Forest_area_age_61_to_80[95] + Model.Forest_area_age_61_to_80[94] +
Model.Forest_area_age_61_to_80[93] + Model.Forest_area_age_61_to_80[92] +
Model.Forest_area_age_61_to_80[91] + Model.Forest_area_age_61_to_80[90] +
Model.Forest_area_age_61_to_80[89] + Model.Forest_area_age_61_to_80[88] +
Model.Forest_area_age_61_to_80[87] + Model.Forest_area_age_61_to_80[86] +
Model.Forest_area_age_61_to_80[85] + Model.Forest_area_age_61_to_80[84] +
Model.Forest_area_age_61_to_80[83] + Model.Forest_area_age_61_to_80[82] +

Model.Forest_area_age_61_to_80[81]) + "Growth_per_hectare_61-80_5" *
 (Model.Forest_area_age_61_to_80[80] + Model.Forest_area_age_61_to_80[79] +
 Model.Forest_area_age_61_to_80[78] + Model.Forest_area_age_61_to_80[77] +
 Model.Forest_area_age_61_to_80[76] + Model.Forest_area_age_61_to_80[75] +
 Model.Forest_area_age_61_to_80[74] + Model.Forest_area_age_61_to_80[73] +
 Model.Forest_area_age_61_to_80[72] + Model.Forest_area_age_61_to_80[71] +
 Model.Forest_area_age_61_to_80[70] + Model.Forest_area_age_61_to_80[69] +
 Model.Forest_area_age_61_to_80[68] + Model.Forest_area_age_61_to_80[67] +
 Model.Forest_area_age_61_to_80[66] + Model.Forest_area_age_61_to_80[65] +
 Model.Forest_area_age_61_to_80[64] + Model.Forest_area_age_61_to_80[63] +
 Model.Forest_area_age_61_to_80[62] + Model.Forest_area_age_61_to_80[61]) +
 "Growth_per_hectare_61-80_6" * (Model.Forest_area_age_61_to_80[60] +
 Model.Forest_area_age_61_to_80[59] + Model.Forest_area_age_61_to_80[58] +
 Model.Forest_area_age_61_to_80[57] + Model.Forest_area_age_61_to_80[56] +
 Model.Forest_area_age_61_to_80[55] + Model.Forest_area_age_61_to_80[54] +
 Model.Forest_area_age_61_to_80[53] + Model.Forest_area_age_61_to_80[52] +
 Model.Forest_area_age_61_to_80[51] + Model.Forest_area_age_61_to_80[50] +
 Model.Forest_area_age_61_to_80[49] + Model.Forest_area_age_61_to_80[48] +
 Model.Forest_area_age_61_to_80[47] + Model.Forest_area_age_61_to_80[46] +
 Model.Forest_area_age_61_to_80[45] + Model.Forest_area_age_61_to_80[44] +
 Model.Forest_area_age_61_to_80[43] + Model.Forest_area_age_61_to_80[42] +
 Model.Forest_area_age_61_to_80[41]) + "Growth_per_hectare_61-80_7" *
 (Model.Forest_area_age_61_to_80[40] + Model.Forest_area_age_61_to_80[39] +
 Model.Forest_area_age_61_to_80[38] + Model.Forest_area_age_61_to_80[37] +
 Model.Forest_area_age_61_to_80[36] + Model.Forest_area_age_61_to_80[35] +
 Model.Forest_area_age_61_to_80[34] + Model.Forest_area_age_61_to_80[33] +
 Model.Forest_area_age_61_to_80[32] + Model.Forest_area_age_61_to_80[31] +
 Model.Forest_area_age_61_to_80[30] + Model.Forest_area_age_61_to_80[29] +
 Model.Forest_area_age_61_to_80[28] + Model.Forest_area_age_61_to_80[27] +
 Model.Forest_area_age_61_to_80[26] + Model.Forest_area_age_61_to_80[25] +
 Model.Forest_area_age_61_to_80[24] + Model.Forest_area_age_61_to_80[23] +
 Model.Forest_area_age_61_to_80[22] + Model.Forest_area_age_61_to_80[21]) +
 "Growth_per_hectare_61-80_8" * (Model.Forest_area_age_61_to_80[20] +
 Model.Forest_area_age_61_to_80[19] + Model.Forest_area_age_61_to_80[18] +
 Model.Forest_area_age_61_to_80[17] + Model.Forest_area_age_61_to_80[16] +
 Model.Forest_area_age_61_to_80[15] + Model.Forest_area_age_61_to_80[14] +
 Model.Forest_area_age_61_to_80[13] + Model.Forest_area_age_61_to_80[12] +
 Model.Forest_area_age_61_to_80[11] + Model.Forest_area_age_61_to_80[10] +
 Model.Forest_area_age_61_to_80[9] + Model.Forest_area_age_61_to_80[8] +
 Model.Forest_area_age_61_to_80[7] + Model.Forest_area_age_61_to_80[6] +
 Model.Forest_area_age_61_to_80[5] + Model.Forest_area_age_61_to_80[4] +
 Model.Forest_area_age_61_to_80[3] + Model.Forest_area_age_61_to_80[2] +
 Model.Forest_area_age_61_to_80[1]))

UNITS: Cubic Meter/Year

DOCUMENT: Definition:

Forest yield decomposed by age group. Each slat of the conveyor had to be addressed separately in order to obtain the output of a nonlinear function. Thus, trees from some slats contribute with more yield than trees from other slats.

Maximum_density_of_forests_age_61_to_80 =
Model.Initial_average_density_of_forest_age_80*Model.Maximum_forest_density_control

UNITS: Cubic Meter/Hectare

DOCUMENT: Definition:

The maximum density to which forests can grow by the age of 80. Calculated based on the initial density of forests aged 80.

Unit_of_measure_of_transit_time = 1

UNITS: Year

"Growth_function_81-100":

"Growth_per_hectare_81-100_1" = 8.994388868

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_81-100_2" = 9.02324722

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_81-100_3" = 9.043807862

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_81-100_4" = 9.051433196

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_81-100_5" = 9.048668526

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_81-100_6" = 9.036323113

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_81-100_7" = 9.015279859

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”. <http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

"Growth_per_hectare_81-100_8" = 8.98685815

UNITS: Cubic Meter/Hectare/Year

DOCUMENT: A non-linear growth function has been estimated based on National Forest Inventory data on average growth rate of forests by age groups. Different points of the non-linear growth function are explicitly shown in separate variables.

Source:

NFI. (2012a). „National Forest Inventory: Forest resources assessment in Romania, cycle I results”. <http://roifn.ro/site/rezultate-ifn-1/>, accessed on 07.02.2019.

NFI. (2018). „National Forest Inventory: Forest resources assessment in Romania, cycle II results”.
<http://roifn.ro/site/rezultate-ifn-2/>, accessed on 07.02.2019.

Growth_potential = (Maximum_density_of_forests_age_81_to_100-
Model.Average_density_of_forest_age_81_to_100)*Model.Forest_area_age_81_to_100/Unit_of_measure_of_transit_time

UNITS: Cubic Meter/Year

DOCUMENT: Definition:

How much the forest can grow before it reaches maximum its maximum density.

Growth_within_stock = MIN(Growth_potential, "Growth_per_hectare_81-100_1" *
(Model.Forest_area_age_81_to_100[160] + Model.Forest_area_age_81_to_100[159] +
Model.Forest_area_age_81_to_100[158] + Model.Forest_area_age_81_to_100[157] +
Model.Forest_area_age_81_to_100[156] + Model.Forest_area_age_81_to_100[155] +
Model.Forest_area_age_81_to_100[154] + Model.Forest_area_age_81_to_100[153] +
Model.Forest_area_age_81_to_100[152] + Model.Forest_area_age_81_to_100[151] +
Model.Forest_area_age_81_to_100[150] + Model.Forest_area_age_81_to_100[149] +
Model.Forest_area_age_81_to_100[148] + Model.Forest_area_age_81_to_100[147] +
Model.Forest_area_age_81_to_100[146] + Model.Forest_area_age_81_to_100[145] +
Model.Forest_area_age_81_to_100[144] + Model.Forest_area_age_81_to_100[143] +
Model.Forest_area_age_81_to_100[142] + Model.Forest_area_age_81_to_100[141]) +
"Growth_per_hectare_81-100_2" * (Model.Forest_area_age_81_to_100[140] +
Model.Forest_area_age_81_to_100[139] + Model.Forest_area_age_81_to_100[138] +
Model.Forest_area_age_81_to_100[137] + Model.Forest_area_age_81_to_100[136] +
Model.Forest_area_age_81_to_100[135] + Model.Forest_area_age_81_to_100[134] +
Model.Forest_area_age_81_to_100[133] + Model.Forest_area_age_81_to_100[132] +
Model.Forest_area_age_81_to_100[131] + Model.Forest_area_age_81_to_100[130] +
Model.Forest_area_age_81_to_100[129] + Model.Forest_area_age_81_to_100[128] +
Model.Forest_area_age_81_to_100[127] + Model.Forest_area_age_81_to_100[126] +
Model.Forest_area_age_81_to_100[125] + Model.Forest_area_age_81_to_100[124] +
Model.Forest_area_age_81_to_100[123] + Model.Forest_area_age_81_to_100[122] +
Model.Forest_area_age_81_to_100[121]) + "Growth_per_hectare_81-100_3" *
(Model.Forest_area_age_81_to_100[120] + Model.Forest_area_age_81_to_100[119] +
Model.Forest_area_age_81_to_100[118] + Model.Forest_area_age_81_to_100[117] +
Model.Forest_area_age_81_to_100[116] + Model.Forest_area_age_81_to_100[115] +
Model.Forest_area_age_81_to_100[114] + Model.Forest_area_age_81_to_100[113] +
Model.Forest_area_age_81_to_100[112] + Model.Forest_area_age_81_to_100[111] +
Model.Forest_area_age_81_to_100[110] + Model.Forest_area_age_81_to_100[109] +
Model.Forest_area_age_81_to_100[108] + Model.Forest_area_age_81_to_100[107] +
Model.Forest_area_age_81_to_100[106] + Model.Forest_area_age_81_to_100[105] +
Model.Forest_area_age_81_to_100[104] + Model.Forest_area_age_81_to_100[103] +
Model.Forest_area_age_81_to_100[102] + Model.Forest_area_age_81_to_100[101]) +
"Growth_per_hectare_81-100_4" * (Model.Forest_area_age_81_to_100[100] +
Model.Forest_area_age_81_to_100[99] + Model.Forest_area_age_81_to_100[98] +
Model.Forest_area_age_81_to_100[97] + Model.Forest_area_age_81_to_100[96] +
Model.Forest_area_age_81_to_100[95] + Model.Forest_area_age_81_to_100[94] +
Model.Forest_area_age_81_to_100[93] + Model.Forest_area_age_81_to_100[92] +
Model.Forest_area_age_81_to_100[91] + Model.Forest_area_age_81_to_100[90] +
Model.Forest_area_age_81_to_100[89] + Model.Forest_area_age_81_to_100[88] +
Model.Forest_area_age_81_to_100[87] + Model.Forest_area_age_81_to_100[86] +

Forest yield decomposed by age group. Each slat of the conveyor had to be addressed separately in order to obtain the output of a nonlinear function. Thus, trees from some slats contribute with more yield than trees from other slats.

Maximum_density_of_forests_age_81_to_100 =

Model.Initial_average_density_of_forest_age_100*Model.Maximum_forest_density_control

UNITS: Cubic Meter/Hectare

DOCUMENT: Definition:

The maximum density to which forests can grow by the age of 100. Calculated based on the initial density of forests aged 100, plus 50%.

Unit_of_measure_of_transit_time = 1

UNITS: Year

{ The model has 473 (473) variables (array expansion in parens).

In root model and 12 additional modules with 6 sectors.

Stocks: 20 (20) Flows: 40 (40) Converters: 413 (413)

Constants: 140 (140) Equations: 313 (313) Graphicals: 94 (94)

}