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Greenhouse
Office

Australian Greenhouse Office

National Carbon Accounting System
Carbon Accounting Model for Forests (CAMFor)

CAMFor Model

CAMFor is a spreadsheet model for determining carbon masses in forest stands and forest estates.

Four key carbon movements are modeled over time to derive the estimates for carbon masses in a stand.

- C1 - Carbon movements during a year (no harvest, thinning or fire)
- C2 - Carbon movements due to harvest or thinning
- C3 - Carbon movements in a stand-replacing fire
- C4 - Carbon movements in regenerating (crown and ground) fire

CAMFor computes carbon masses in tonnes/hecatre over the life of the stand. CAMFor provides for the accumulation of stands into groups of similar stands and then into forest estates.

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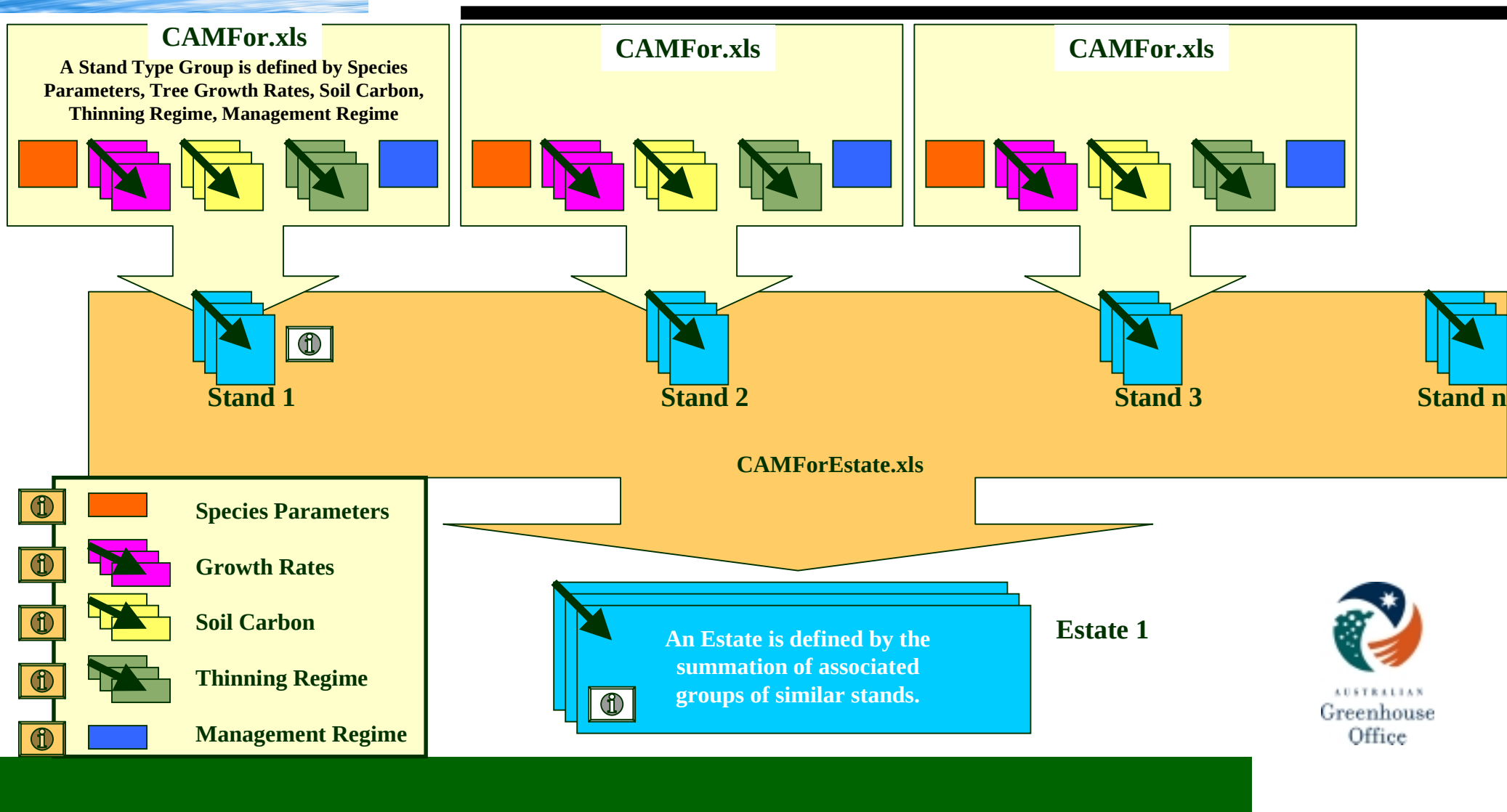
Application Overview



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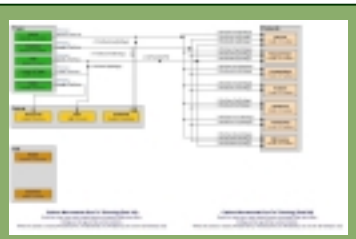
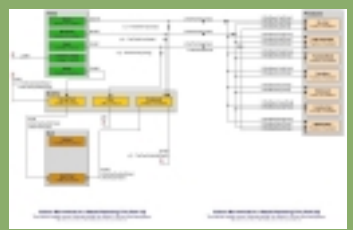
Carbon Movement Models

The four key carbon movements affecting the end-of-rotation carbon mass in a stand

No thinning or fire



Thinning



Stand-replacing fire

Ground or Crown/Ground fire

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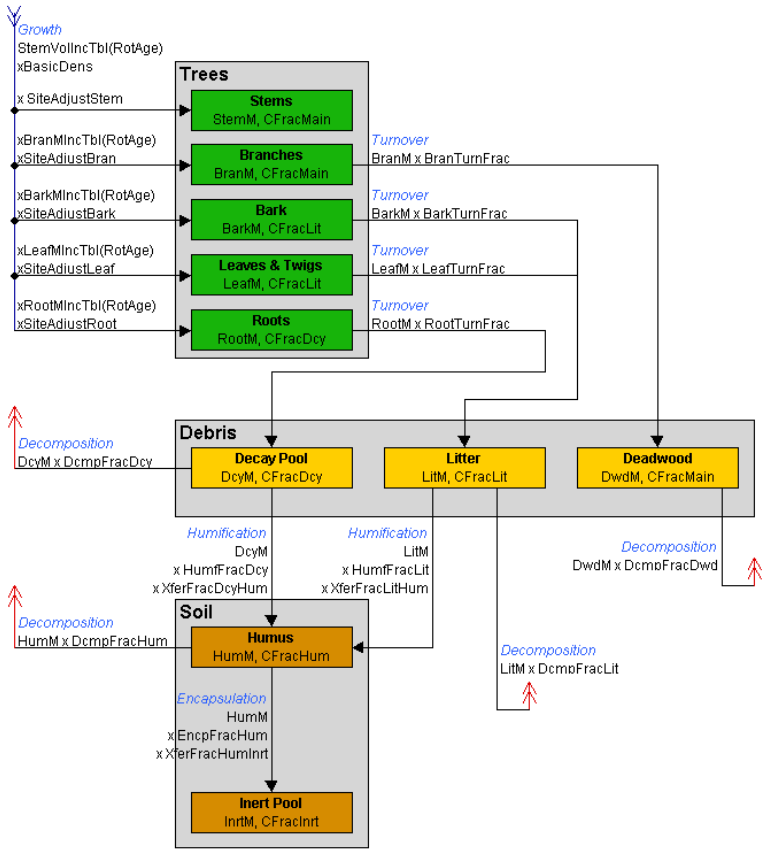
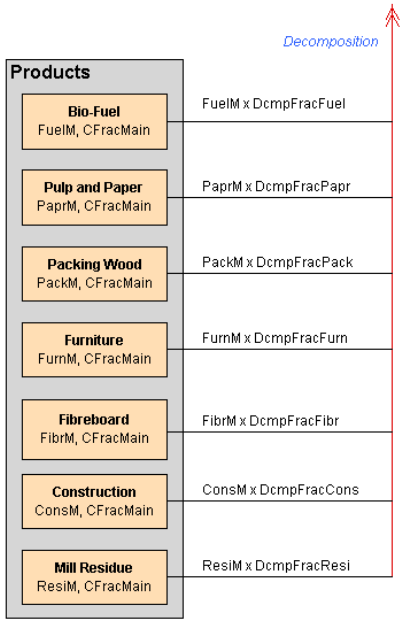
Carbon Movement Models
No Fire or Thinning



Carbon Movements During a Year (No Thinning or Fire) (Part 1/2)
The vertical double arrows indicate transfer of carbon to or from the atmosphere.
Each box has mass and carbon fraction (content) under the name.
RotAge is the age of the current rotation.



Carbon Movements During a Year (No Thinning or Fire) (Part 2/2)
The vertical double arrows indicate transfer of carbon to or from the atmosphere.
Each box has mass and carbon fraction (content) under the name.

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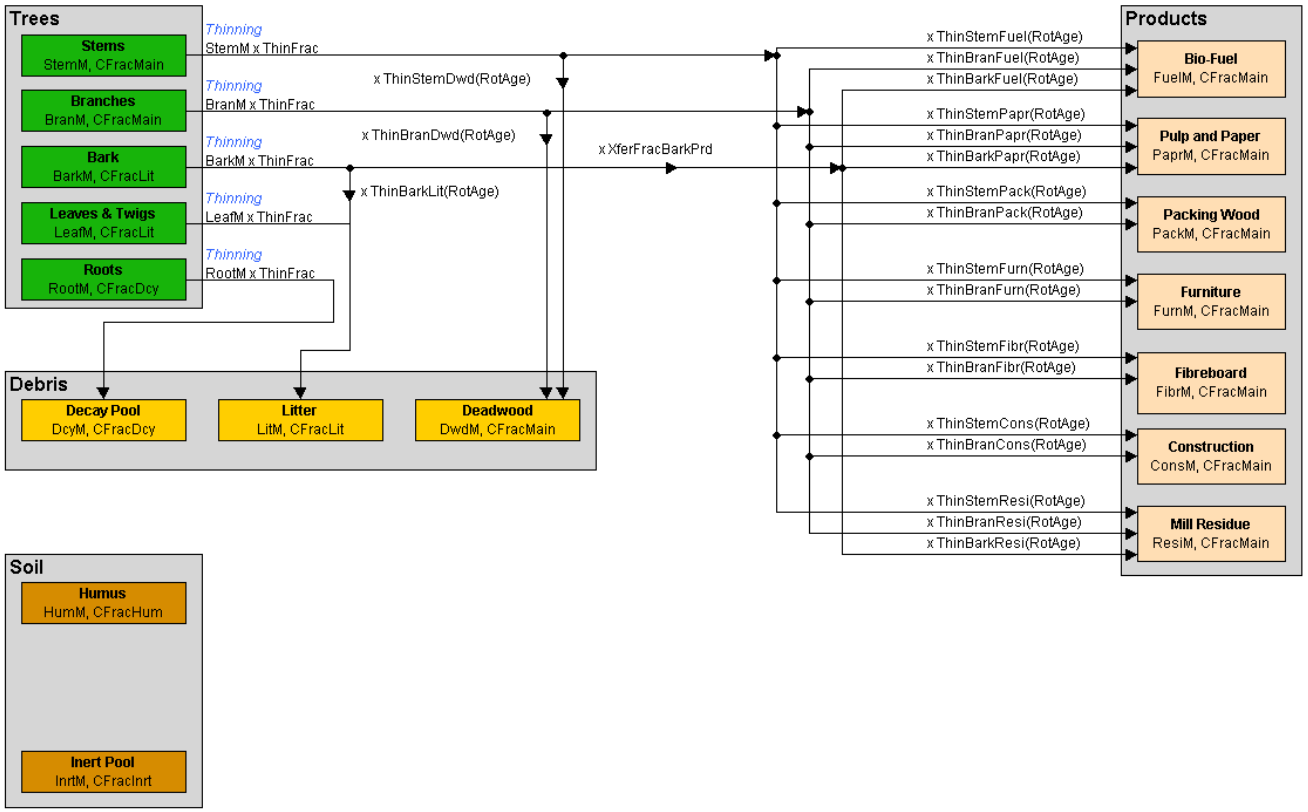
Carbon Movement Models
Thinning



Carbon Movements Due To Thinning (Part 1/2)

Each box has mass and carbon fraction (content) under the name.
RotAge is the age of the current rotation.
When the stand is natural,ThinStemDwd, ThinBranDwd and ThinBarkLit are one for all RotAges and all other ThinXXXXYYYY fractions are zero.

Carbon Movements Due To Thinning (Part 2/2)

Each box has mass and carbon fraction (content) under the name.
RotAge is the age of the current rotation.
When the stand is natural,ThinStemDwd, ThinBranDwd and ThinBarkLit are one for all RotAges and all other ThinXXXXYYYY fractions are zero.

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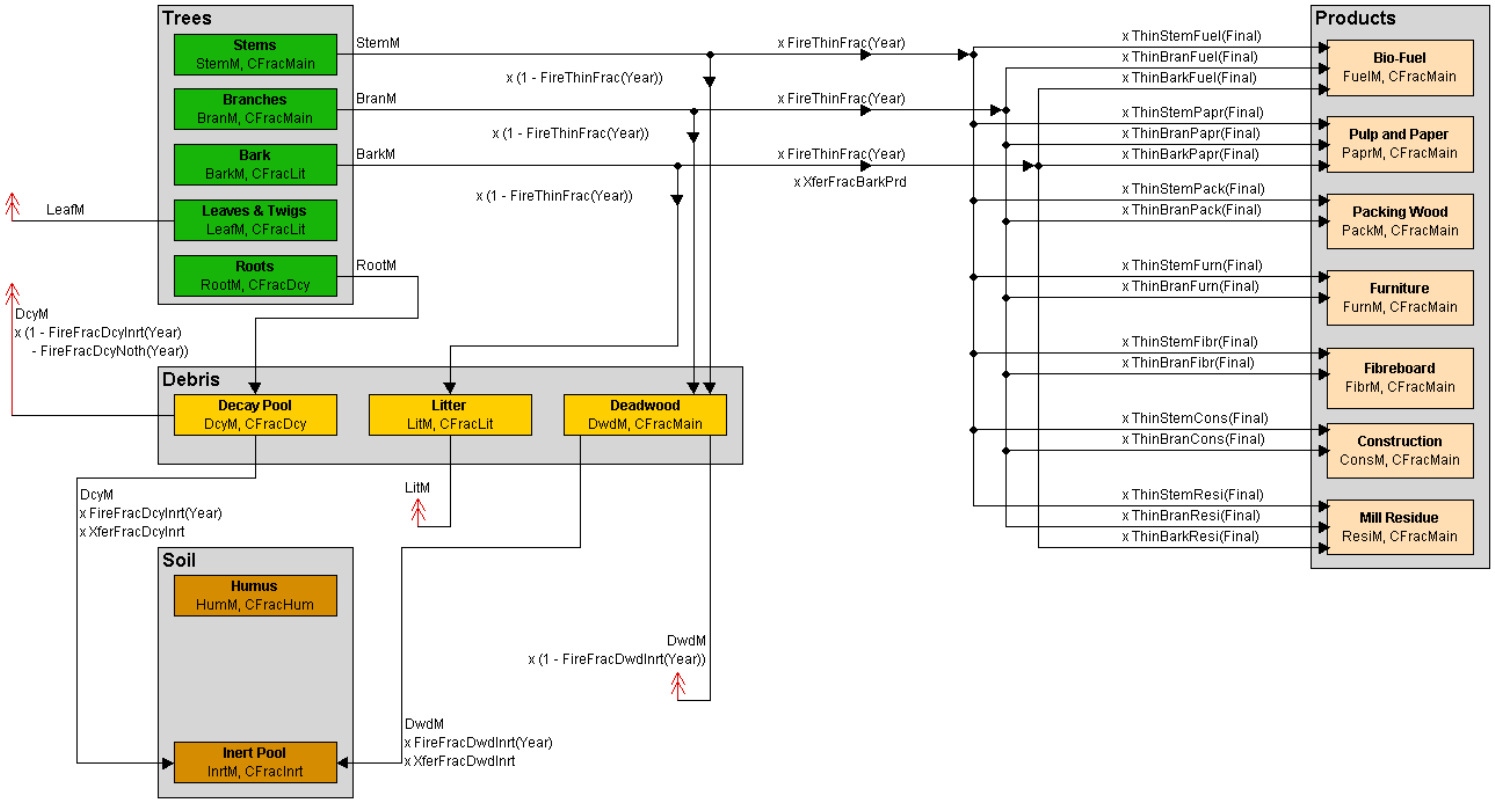
Carbon Movement Models
Stand-Replacing Fire



Carbon Movements In a Stand-Replacing Fire (Part 1/2)
The vertical double arrows indicate transfer of carbon to or from the atmosphere.
'Final' means for a final thin (maximum RotAge).

Carbon Movements In a Stand-Replacing Fire (Part 2/2)
The vertical double arrows indicate transfer of carbon to or from the atmosphere.
'Final' means for a final thin (maximum RotAge).

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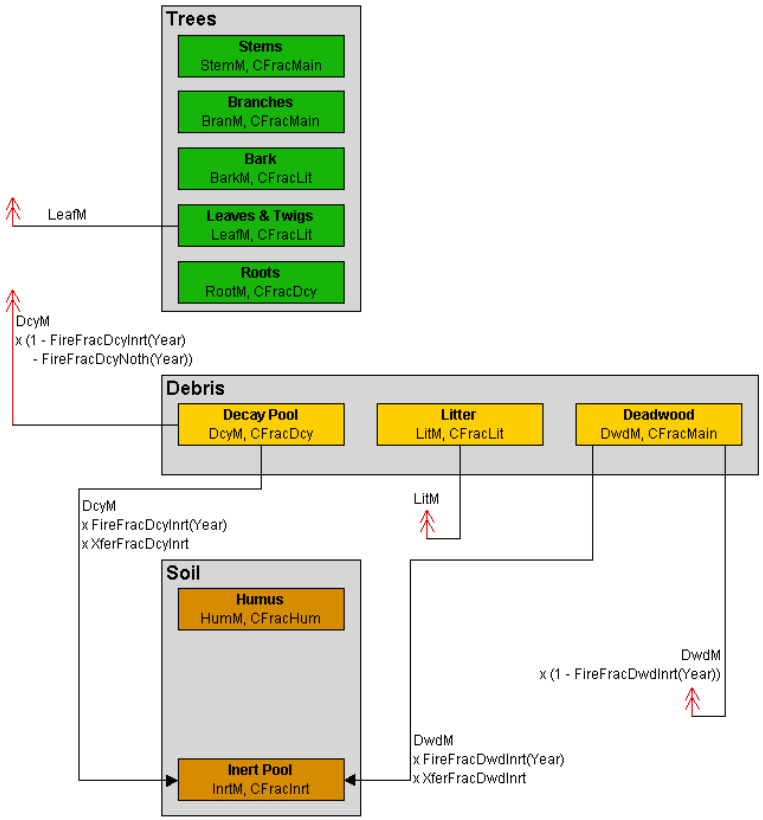
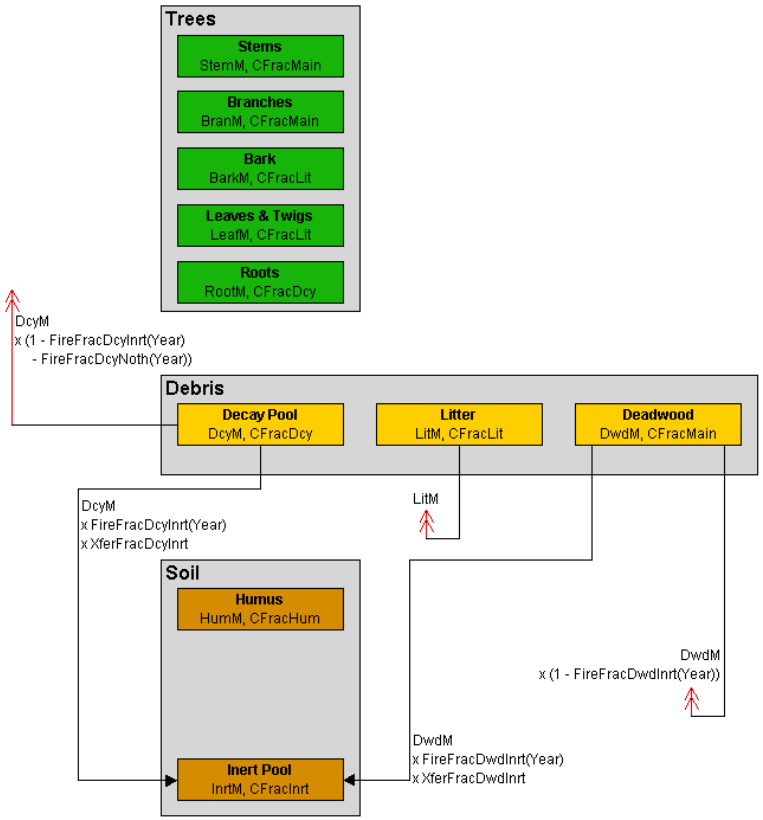
Carbon Movement Models
Crown & Ground Fire



Carbon Movements In a Regenerating (Crown and Ground) Fire
The vertical double arrows indicate transfer of carbon to or from the atmosphere.



Carbon Movements In a Regenerating (Ground) Fire
The vertical double arrows indicate transfer of carbon to or from the atmosphere.

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Input
Management Regime

Management Regime Parameters			
Name	*Description*	*Value*	*Units*
Managed or Natural?			
Managed	Stand is managed and thinned by people (enter TRUE)		
	or is left alone and natural (enter FALSE)	TRUE	
Rotations (only relevant if stands are managed rather than natural)			
RotLen	Rotation length (1 to 500 years)	30	
NumRots	Number of rotations (note: a 'rotation' is cut short		
	by a stand-replacing fire) (0 to 999)	99	
Relative Growth Adjustments for Non-Standard Sites			
SiteAdjustStem	Stem adjustment	1.00	
SiteAdjustBran	Branch adjustment	0.95	
SiteAdjustBark	Bark adjustment	1.10	
SiteAdjustLeaf	Leaves and twigs adjustment	1.20	
SiteAdjustRoot	Root adjustment	0.90	
Initial Tree Components			
StemVolInit	Initial volume of stems	1.00	m3 / ha
BranMInit	Initial mass of branches	0.60	t / ha
BarkMInit	Initial mass of bark	0.30	t / ha
LeafMInit	Initial mass of leaves and twigs	2.00	t / ha
RootMInit	Initial mass of roots	0.50	t / ha
Initial Debris Components			
DwdMInit	Initial mass of deadwood	2.30	t / ha
LitMInit	Initial mass of litter	1.00	t / ha
DcyMInit	Initial mass of decay pool	0.75	t / ha
Initial Soil Components			
HumMInit	Initial mass of humus	0.50	t / ha
InrtMInit	Initial mass of inert pool	0.05	t / ha

Key
For Any Cell in this Workbook:

Cell contains raw data, that you enter. Do not change anything in a cell that is not colored like this (or error red, next).

Error in your data. Check that fractions add to 1, and so on.

Note: This workbook is self-contained (no cell refers to a cell in another workbook).

Input Data: Management Information

Each stand can have unique management properties that reflect initial conditions & site specific conditions

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Input
Species Parameters

Species Parameters			
Name	*Description*	*Value*	*Units*
Densities			
BasicDensKg	Density of stem wood (using kg)	440	kg / m3
Turnover Fractions (fractions lost due to turnover each year)			
BranTurnFrac	Branch turnover fraction (fraction that becomes deadwood)	0.03	
BarkTurnFrac	Bark turnover fraction (fraction that becomes litter)	0.10	
LeafTurnFrac	Leaf turnover fraction (fraction that becomes litter)	0.50	
RootTurnFrac	Root turnover fraction (fraction that becomes decay material)	0.07	
Self Thinning (only relevant if the Managment Regime parameter 'Managed' is FALSE)			
TreeMortFrac	Fraction of trees that die each year naturally	0.02	
Decomposition Fractions (fractions lost due to decomposition each year)			
DcmpFracFuel	Bio-fuel	1.00	
DcmpFracPapr	Pulp and paper	0.33	
DcmpFracPack	Packing wood	0.20	
DcmpFracFurn	Furniture, poles and preservatives	0.20	
DcmpFracFibr	Fibre board	0.04	
DcmpFracCons	Construction wood	0.02	
DcmpFracResi	Mill residue	0.02	
DcmpFracDwd	Deadwood	0.10	
DcmpFracLit	Litter	0.300	
DcmpFracDcy	Decay pool	0.050	
DcmpFracHum	Humus	0.012	
Humification and Encapsulation Fractions (fractions lost due to process each year)			
HumfFracDcy	Humification fraction of the decay pool	0.080	
HumfFracLit	Humification fraction of litter	0.050	
EncpFracHum	Encapsulation fraction of humus	0.005	
Carbon Fractions (fraction of material that is carbon, by weight)			
CFracMain	Carbon fraction of stem, branches, deadwood, and products	0.45	
CFracLit	Carbon fraction of bark, leaves and twigs, and litter	0.50	
CFracDcy	Carbon fraction of roots and decay material	0.40	
CFracHum	Carbon fraction of humus	0.65	
CFracInrt	Carbon fraction of inert material	0.85	

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Input Data: Species Information

The species that populate each stand will have unique properties that effect carbon flows through the stand over time

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Input
Soil Carbon

Choose the source for the soil carbon mass data:

1 = Let CAMFor calculate it (from the humification and encapsulation fractions and the carbon fractions)
2 = Use the data in the Soil Carbon table (instead of letting CAMFor calculate it)

<--- Enter either 1 or 2 in the Soil Carbon Source table

Soil Carbon Source
SoilCMType
1

Soil Carbon

Year	Soil Carbon
yr	t / ha
	SoilCMTbl
0	0.0
1	0.2
2	0.4
3	0.6
4	0.8
5	1.0
6	1.2
7	1.4
8	1.6
9	1.8
10	2.0
11	2.2
12	2.4

"TIME"

Soil Carbon Notes

You may wish to externally generate your soil carbon mass data. If so, this is where you enter that data.

If you set the Soil Carbon Source to 1 then CAMFor calculates the soil carbon mass according to the CAMFor model and the data in the Soil Carbon table is ignored.

If you set the Soil Carbon Source to 2 then CAMFor copies the data in the Soil Carbon table into the soil carbon mass column in the Main sheet, thereby replacing the soil carbon mass that CAMFor calculates. In this case CAMFor still goes ahead and calculates the mass of humus and the mass of the inert pool -- but it ignores those calculations when it comes to computing the soil carbon mass because it gets the soil carbon mass from the Soil Carbon table instead. You should copy the data you have externally calculated for the soil carbon mass into the Soil Carbon table.

Note that externally calculated data may not reflect the thinning or fires that CAMFor knows about.

Input Data: Rotation x Soil Carbon

Key

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Error in your data. Check that fractions add to 1, and so on.

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Input
Growth Rates / Mass Increase

Choose the type of data you are using in the Growth Table to specify how the trees grow:

1 = Yearly increases in stem volume
2 = Yearly increases in aboveground mass (mass of stem, branches, bark and leaves, post turnover)

Only the data in the column you have indicated is used by CAMFor in its calculations. (CAMFor uses the StemVolIncTbl column of the Growth Calculations table in all of its calculations on other sheets.)

<--- Enter either 1 or 2 in the Growth Driver table
(Warning: Excel may take a few seconds to recalculate)

Growth Driver
GrthType
1

Growth

Age of Rotation	Yearly Increase in Stem Volume	Yearly Increase in Aboveground Mass	Increase in Mass Relative to Increase in Mass of Stem			
			Branches	*Bark*	*Leaves & Twigs*	*Roots*
yr	m3 / ha	t / ha				
	StemVolInc	AbgMInc	BranMIncTbl	BarkMIncTbl	LeafMIncTbl	RootMIncTbl
1	0.50	0.13	0.98	0.98	1.90	0.45
2	1.00	1.45	0.96	0.96	1.80	0.40
3	1.50	2.33	0.94	0.94	1.70	0.35
4	2.00	2.97	0.92	0.92	1.60	1.30
5	2.50	3.47	0.90	0.90	1.50	1.25

"TIME"

Key
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The growth rate of the stand will have a direct effect the carbon mass accumulation in the stand.

CAMFor has two methods of estimating yearly increase in carbon mass -
Stem Volume Flux
Above Ground Mass Flux

Input Data:
Growth rates

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Input
Thinning History / Weight Fraction

Thinning

Years Since Rotation Began	Fraction of Trees Thinned	Fractions of Thinned Stem Weight Allocated to Debris or Products*								
		Deadwood	*Bio-Fuel*	*Paper*	*Packing*	*Furniture*	*Fibre Board*	*Construction*	*Mill Residue*	*Row Sum*
ThinAge	ThinFracTbl	ThinStemDwd	ThinStemFuel	ThinStemPapr	ThinStemPack	ThinStemFurn	ThinStemFibr	ThinStemCons	ThinStemResi	
10	0.17	0.10	0.20	0.40	0.10	0.10	0.10	0.00	0.00	1.00
15	0.22	0.10	0.20	0.40	0.10	0.10	0.10	0.00	0.00	1.00
20	0.21	0.10	0.20	0.40	0.10	0.10	0.10	0.00	0.00	1.00
25	0.18	0.10	0.20	0.40	0.10	0.10	0.10	0.00	0.00	1.00
30	0.17	0.10	0.20	0.40	0.10	0.10	0.10	0.00	0.00	1.00
45	0.15	0.10	0.20	0.40	0.10	0.10	0.10	0.00	0.00	1.00
50	0.13	0.10	0.20	0.10	0.10	0.10	0.10	0.20	0.10	1.00
55	0.11	0.10	0.20	0.10	0.10	0.10	0.10	0.20	0.10	1.00
60	0.10	0.10	0.20	0.10	0.10	0.10	0.10	0.20	0.10	1.00
65	0.08	0.10	0.20	0.10	0.10	0.10	0.10	0.20	0.10	1.00
70	0.07	0.10	0.20	0.10	0.10	0.10	0.10	0.20	0.10	1.00
75	0.06	0.10	0.20	0.10	0.10	0.10	0.10	0.20	0.10	1.00
										1.00
85	0.04	0.10	0.20	0.10	0.10	0.10	0.10	0.20	0.10	1.00
90	0.04	0.10	0.20	0.10	0.10	0.10	0.10	0.20	0.10	1.00
									0.10	1.00

"TIME"

Input Data: Thinning fractions x Allocation Fractions

The stand thinning regime (frequency, intensity, end-use) is critical in the estimation of carbon mass over time.

Key

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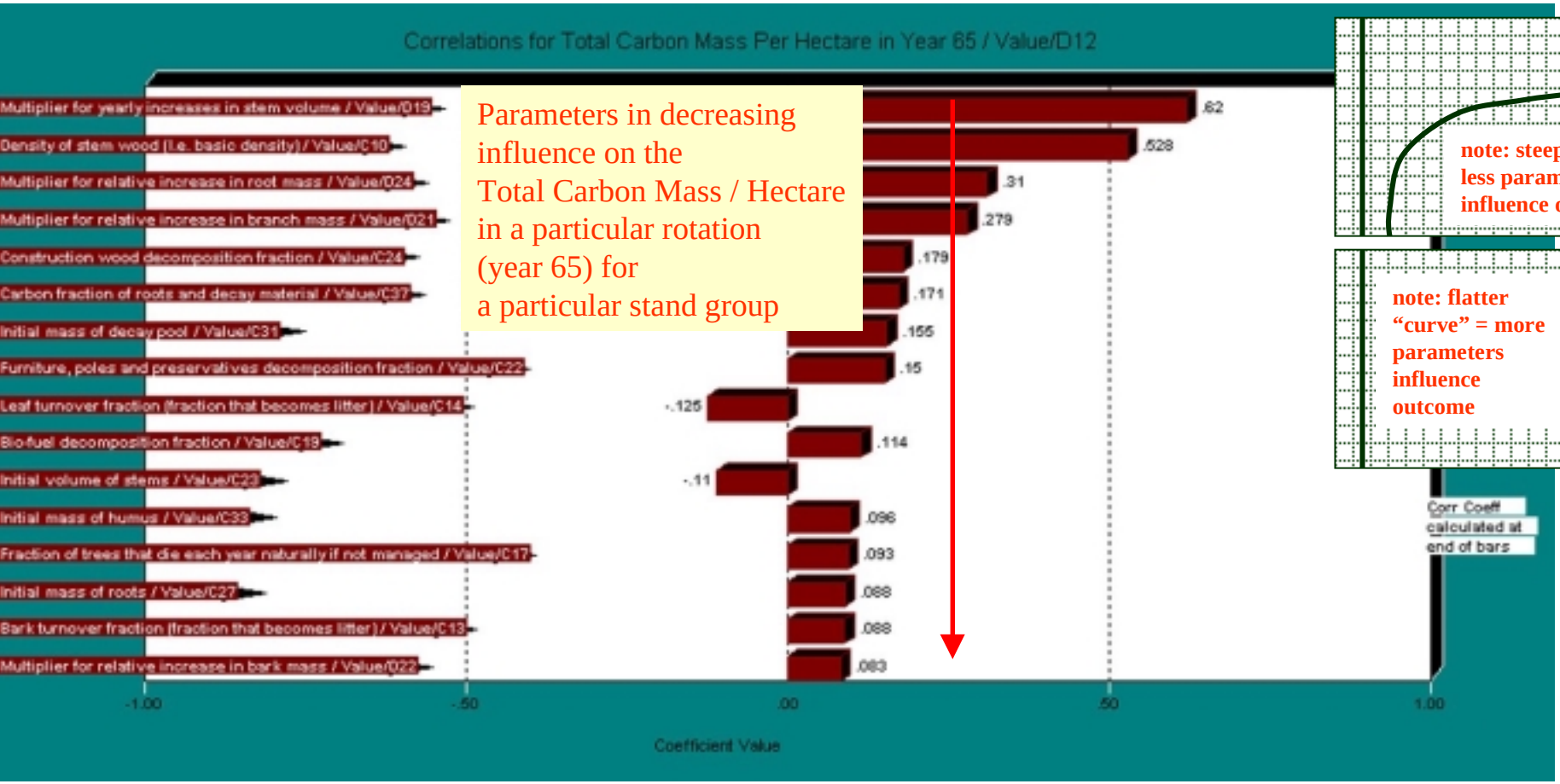
Sensitivity
Parameter Influence



Parameters in decreasing influence on the Total Carbon Mass / Hectare in a particular rotation (year 65) for a particular stand group

note: steeper "curve" = less parameters influence outcome

note: flatter "curve" = more parameters influence outcome

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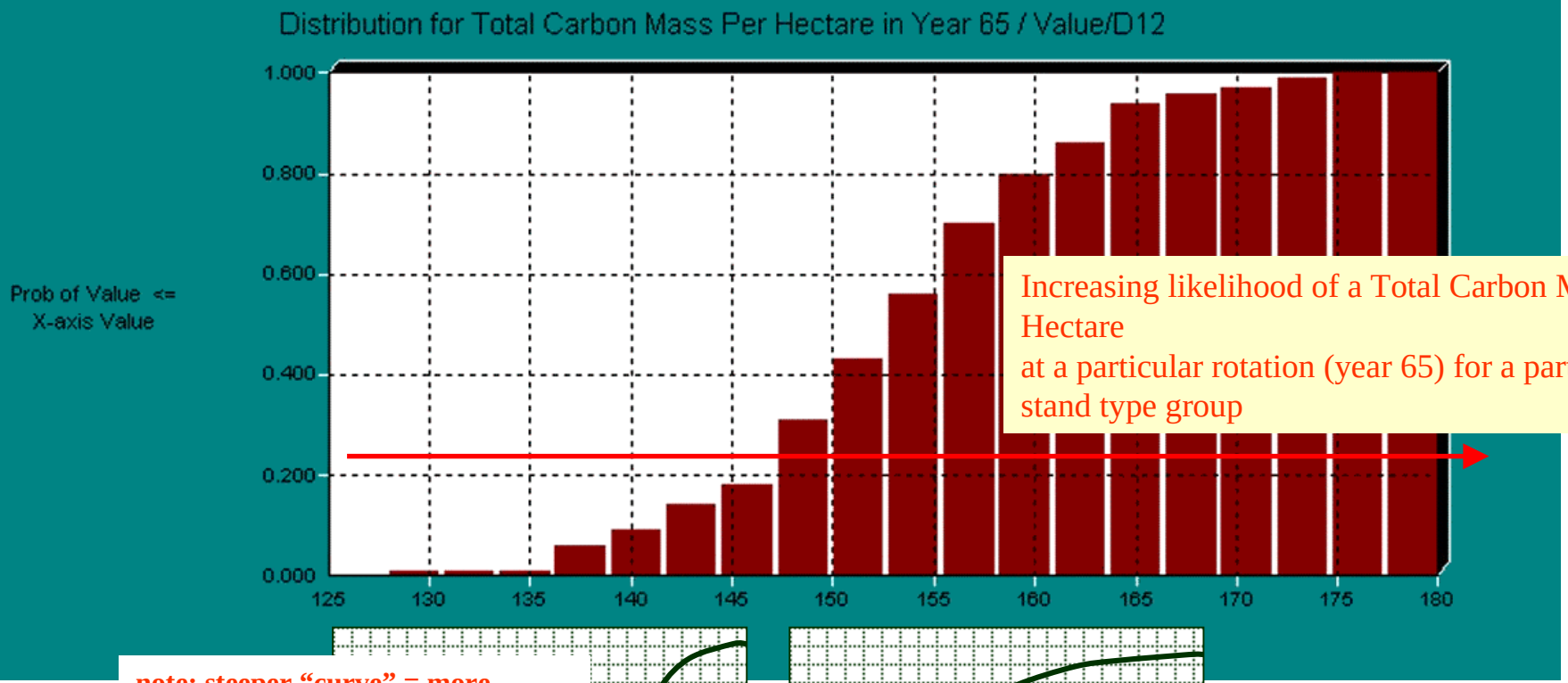
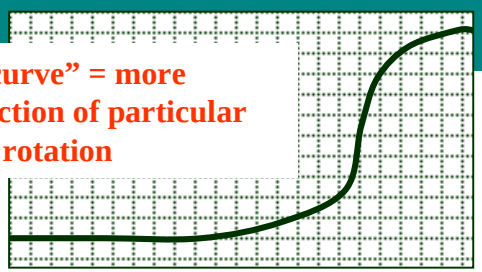
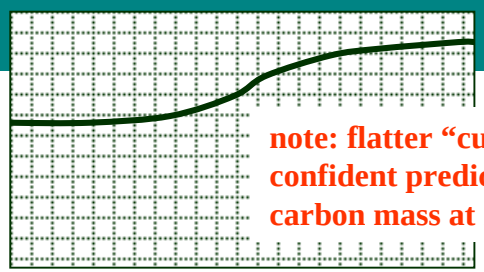
Sensitivity
Carbon Mass Confidence



Increasing likelihood of a Total Carbon Mass / Hectare
at a particular rotation (year 65) for a particular stand type group



note: steeper "curve" = more confident prediction of particular carbon mass at rotation



note: flatter "curve" = less confident prediction of particular carbon mass at rotation

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Output
Stand Type Group

Stand Type Group

Stand Type Group

Name	Stand Type Group Example 1
Notes	This specific stand data is purely for illustrating how CAMFor works. Any resemblance to any real specific stand type group is purely acc... This data should not be used as the basis for any realistic stand type... data
Number of Stands	2
Number of Stand Type Groups	1
Total Area (ha)	295
Stand Type Group Start Year	1990

What's Going On

This sheet is where we calculate the carbon masses of the stand type group that consists of the stands in the 'Stand X' sheets (X = 1,2,3,...). A stand type group is a bunch of stands with the same management regime and species (and are thus in the same CAMFor workbook). The Carbon Masses table on this sheet is the sum of the Carbon Masses tables on the 'Stand X' sheets.

This sheet is mainly an output sheet; do not enter anything on this sheet -- except in the light blue cells (name and notes in the 'Stand Type Group' table, years in the 'Carbon Masses in Years of Special Interest' table).

Input Data

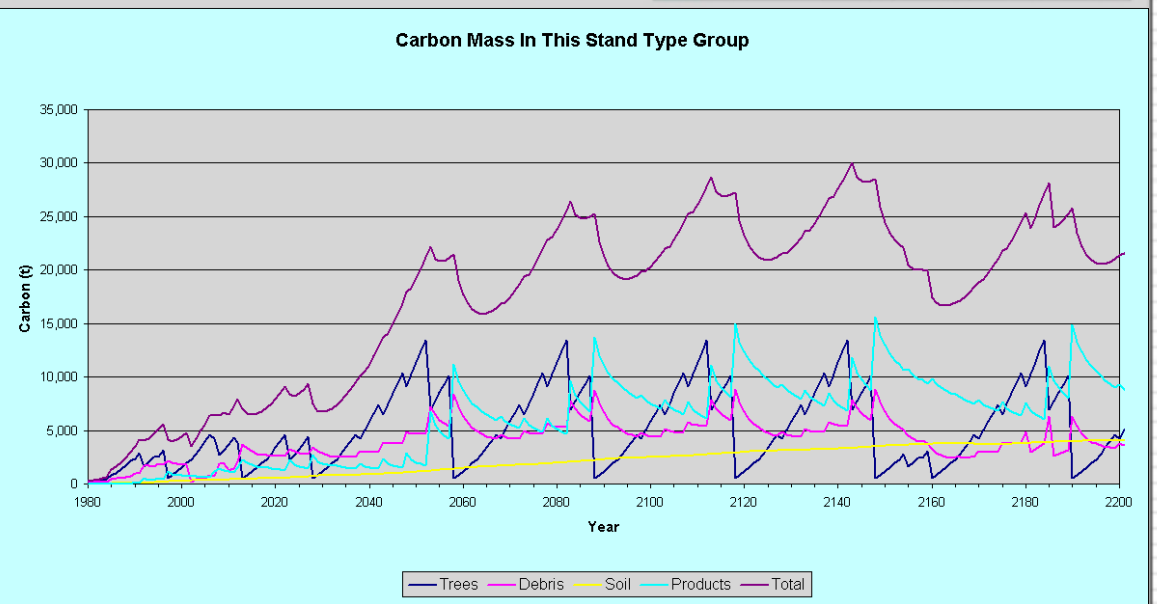
A 'Stand Type Group' is a group of similar stands (same species and and management regime).

Carbon Masses in Years of Special Interest

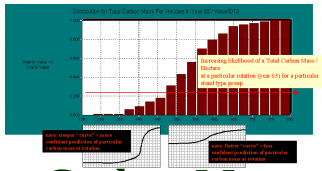
Year	Row Index	Carbon Mass in Trees	Carbon Mass in Debris	Carbon Mass in Soil	Carbon Mass in Products	Total Carbon Mass in Stand and Products
		t	t	t	t	t
1990	1	138	138	28	0	382
1995	16	2,536	1,989	148	584	5,149
2000	21	1,957	1,036	358	780	4,551
2005	26	2,873	1,886	879	1,484	6,988
2009	30	3,176	1,970	875	1,282	7,183
2010	31	3,718	1,250	922	1,150	7,049
2011	32	4,282	1,484	922	1,063	7,762
2012	33	3,902	2,112	923	1,559	8,495
2028	41	3,308	2,782	1,833	1,391	8,514
2108	121	6,829	4,666	1,873	7,626	19,993

Carbon Masses

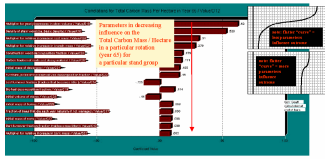
Year	Carbon Mass in Trees	Carbon Mass in Debris	Carbon Mass in Soil	Carbon Mass in Products	Total Carbon Mass in Stand and Products
	t	t	t	t	t
1990	138	138	28	0	382
1991	147	138	27	0	332
1992	213	162	27	0	483
1993	318	171	27	0	616
1994	450	190	27	0	667
1995	640	459	74	0	1,373
1996	1,030	532	74	0	1,636
1997	1,221	566	73	0	1,990
1998	1,710	651	73	0	2,434
1999	2,148	736	73	0	2,957
2000	2,382	968	73	143	3,566
2001	2,919	1,042	73	83	4,116
2002	1,686	1,760	139	512	4,076
2003	2,081	1,695	139	402	4,297
2004	2,511	1,674	140	353	4,677
2005	2,536	1,909	140	564	5,149
2006	3,124	1,871	140	432	5,568
2007	662	2,199	389	1,161	4,291
2008	915	2,017	389	845	4,165
2009	1,195	1,999	389	845	4,298
2010	1,667	1,836	389	768	4,661
2011	2,080	1,919	389	713	4,926
2012	2,239	147	681	801	3,868
2013	2,681	616	680	704	4,681
2014	3,289	665	680	659	5,393
2015	3,986	520	787	823	6,048
2016	4,627	833	786	992	6,750
2017	4,247	863	915	1,112	6,977
2018	2,673	1,958	875	1,454	6,960
2019	3,176	1,970	875	1,262	7,183
2020	3,718	1,250	922	1,158	7,049
2021	4,282	1,484	922	1,063	7,762
2022	3,902	2,112	922	1,559	8,495
2023	552	3,709	1,029	2,260	7,529
2024	915	3,345	1,029	1,867	7,156
2025	1,195	3,378	1,030	1,782	7,385
2026	1,557	3,891	1,030	1,656	7,134
2027	2,080	3,767	1,031	1,547	7,353
2028	2,379	3,816	1,032	1,456	7,684
2029	2,681	3,733	1,032	1,464	8,032
2030	3,380	3,702	1,033	1,391	8,514
2031	3,986	3,707	1,034	1,339	9,067
2032	4,627	3,739	1,035	1,273	9,674
2033	2,223	3,349	1,287	2,254	9,032
2034	2,724	3,114	1,288	1,701	8,827
2035	3,283	2,870	1,289	1,845	9,080
2036	3,934	2,895	1,290	1,538	9,470
2037	4,431	2,879	1,291	1,493	9,966
2038	662	3,666	1,589	2,747	8,294
2039	915	3,153	1,590	2,118	7,586



Sensitivity



Carbon Mass Confidence



Carbon Mass Influence

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Stand Type Group Summary Table

Stand Type Group	
Name	Stand Type Group Example 1
Notes	This specific-stand data is purely for illustrating how CAMFor works. Any resemblance to any real specific stand type group is purely accidental. This data should not be used as the basis for any realistic stand type group data.
Number of Stands	2
Number of Stand Type Groups	1
Total Area (ha)	205
Stand Type Group Start Year	1980

Input Data: Stand Type Group Information

What's Going On

This sheet is where we calculate the carbon masses of the stand type group that consists of the stands in the 'Stand X' sheets (X = 1,2,3,...). A stand type group is a bunch of stands with the same management regime and species (and are thus in the same CAMFor workbook). The Carbon Masses table on this sheet is the sum of the Carbon Masses tables on the 'Stand X' sheets.

This sheet is mainly an output sheet; do not enter anything on this sheet -- except in the light blue cells (name and notes in the 'Stand Type Group' table, years in the 'Carbon Masses in Years of Special Interest' table).

Key

For Any Cell in this Worbook:

Cell contains raw data, that you enter. Do not change anything in a cell that is not colored like this (or error red, next).

Error in your data. Check that fractions add to 1, and so on.

Note: This workbook is self-contained (no cell refers to a cell in another workbook).

AUSTRALIAN Greenhouse Office

Stand Type Group

Carbon Masses in Special Years

Carbon Masses in Years of Special Interest

Year	Row Index	Carbon Mass in Trees	Carbon Mass in Debris	Carbon Mass in Soil	Carbon Mass in Products	Total Carbon Mass in Stand and Products
yr		t	t	t	t	t
1980	1	136	138	28	0	**302**
1995	16	2,536	1,722	537	564	**5,359**
2000	21	1,557	1,625	1,365	769	**5,317**
2008	29	2,073	1,833	2,516	1,464	**8,487**
2009	30	3,[illegible]6	1,[illegible]5	2,[illegible]0	1,[illegible]2	**8,[illegible]3**
2010	31	3,718	1,167	2,679	1,160	**8,[illegible]15**
2011	32	4,292	1,368	2,702	1,063	**9,[illegible]26**
2012	33	3,902	1,960	2,788	1,568	**10,158**
2020	41	3,388	2,196	3,485	1,341	**10,411**
2100	121	5,825	2,796	11,945	7,526	**28,092**

CAMFor will calculate Carbon masses for the stand for any user-defined year of interest

Total for stand type group in 2000

Totals for stand type group components in 2000

Input Data: Years of Interest

Key

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AUSTRALIAN Greenhouse Office

Stand Type Group
Carbon Masses

Carbon Masses

Year	Carbon Mass in Trees	Carbon Mass in Debris	Carbon Mass in Soil	Carbon Mass in Products	Total Carbon Mass in Stand and Products
yr	t	t	t	t	t
EstYear	EstTreeCM	EstDebrCM	EstSoilCM	EstPrdCM	
1980	136	138	28	0	**302**
1981	147	154	31	0	**332**
1982	213	155	35	0	**404**
1983	318	160	40	0	**518**
1984	450	176	45	0	**671**
1985	840	440	99	0	**1,380**
1986	1,[illegible]0	[illegible]3	1[illegible]3	[illegible]	**1,[illegible]6**
1987	1,381	5[illegible]4	1[illegible]0	[illegible]0	**2,0[illegible]5**
1988	1,7[illegible]0	5[illegible]7	1[illegible]0	[illegible]0	**2,4[illegible]7**
1989	2,1[illegible]8	6[illegible]9	1[illegible]3	[illegible]0	**2,9[illegible]0**
1990	2,3[illegible]2	8[illegible]6	2[illegible]0	14[illegible]	**3,591**
1991	2,9[illegible]8	9[illegible]7	2[illegible]8	8[illegible]	**4,176**
1992	1,6[illegible]6	1,7[illegible]1	3[illegible]7	51[illegible]	**4,245**
1993	2,061	1,584	427	402	**4,474**
1994	2,511	1,522	483	353	**4,868**
1995	2,536	1,722	537	564	**5,359**
1996	3,124	1,642	602	432	**5,800**
1997	552	2,159	1,185	1,152	**5,048**
1998	815	1,904	1,255	945	**4,918**

Total for stand type group in 1984

Totals for stand type group components in 1984

Key

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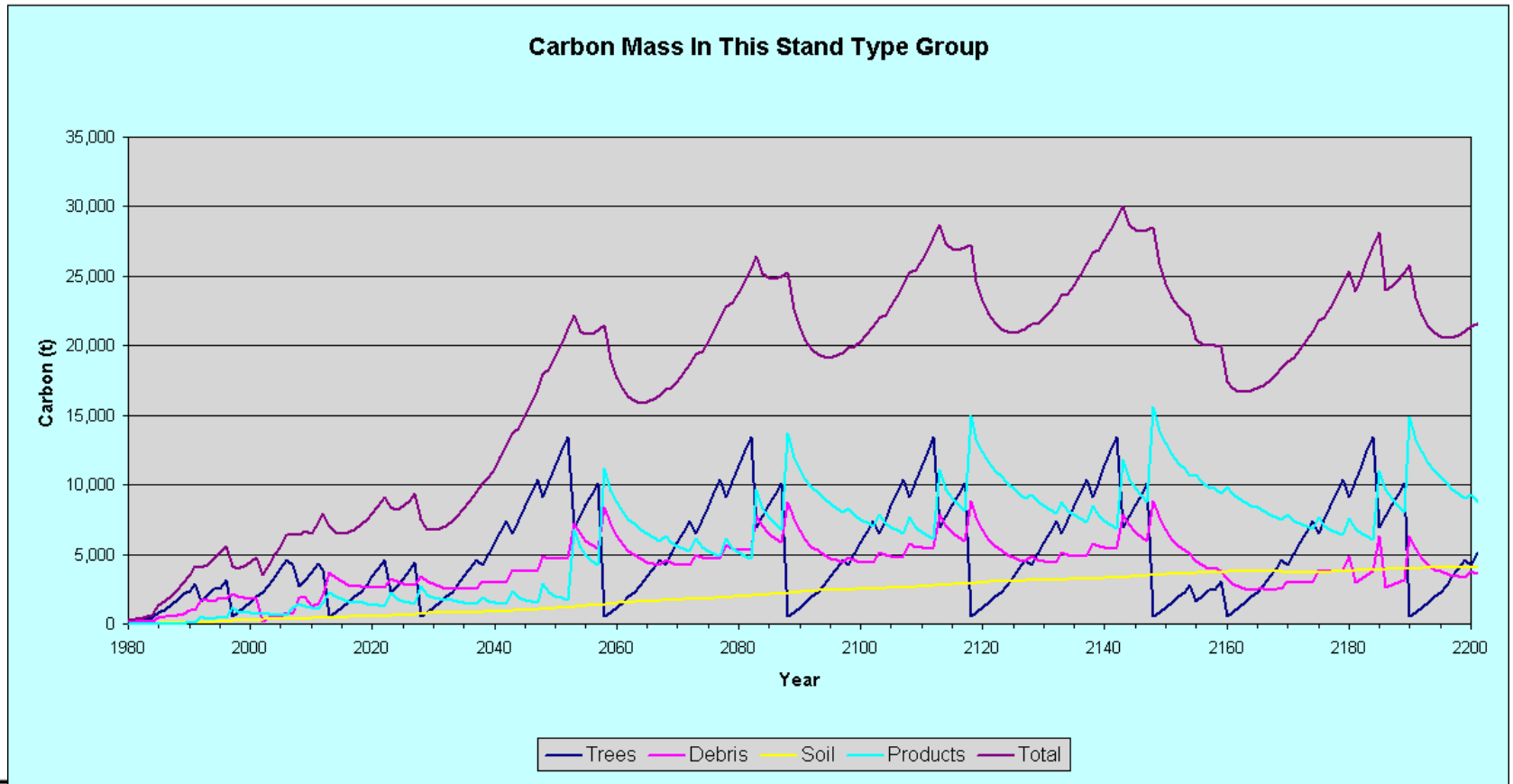
AUSTRALIAN Greenhouse Office

Stand Type Group

Carbon Mass Graphic



Key

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AUSTRALIAN Greenhouse Office

Output Estate

Estate

Estate	
Name	Example of an estate
Notes	This is an estate.
Number of Stands	2
Number of Stand Type Groups	1
Total Area (ha)	205
Estate Start Year	1980

What's Going On

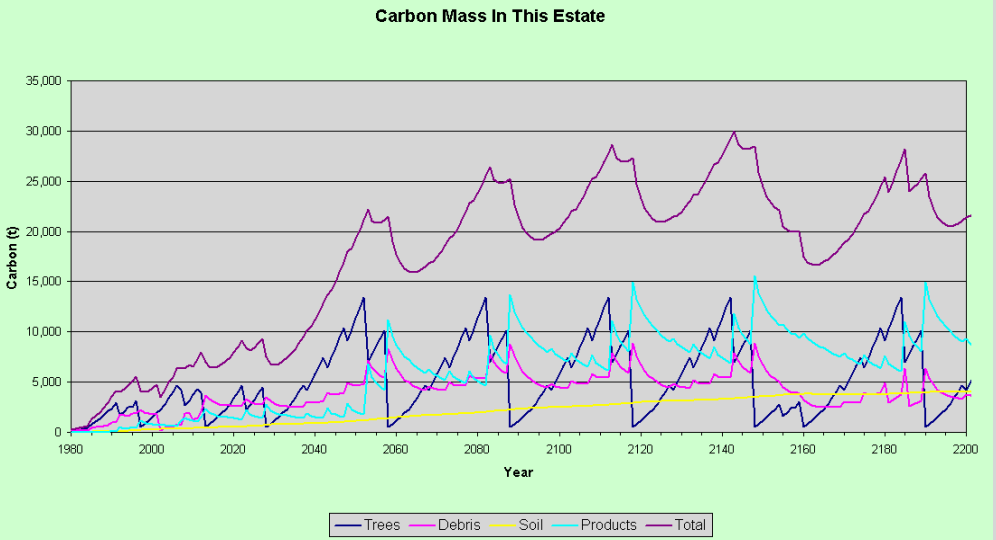
This sheet is where we add the carbon masses of the stand type groups in the 'Group X' sheets (X = 1,2,3,..) to get the carbon masses for the estate that consists of those stand type groups.

This sheet is mainly an output sheet; do not enter anything on this sheet -- except in the light blue cells (name and notes in the 'Estate' table, years in the 'Carbon Masses in Years of Special Interest' table).

Input Data

Carbon Masses in Years of Special Interest

Year	Row Index	Carbon Mass in Trees	Carbon Mass in Debris	Carbon Mass in Soil	Carbon Mass in Products	Total Carbon Mass in Stand and Products
yr		t	t	t	t	t
1980	1	136	138	28	0	**302**
1995	16	2,536	1,722	537	564	**5,359**
2000	21	1,557	1,625	1,365	769	**5,317**
2008	29	2,673	1,833	2,516	1,464	**8,487**
2009	30	3,176	1,785	2,570	1,262	**8,793**
2010	31	3,718	1,167	2,679	1,150	**8,715**
2011	32	4,292	1,368	2,702	1,063	**9,426**
2012	33	3,902	1,960	2,738	1,558	**10,158**
2020	41	3,388	2,196	3,435	1,391	**10,411**
2100	121	5,825	2,796	11,945	7,526	**28,092**



Carbon Masses

Year	Carbon Mass in Trees	Carbon Mass in Debris	Carbon Mass in Soil	Carbon Mass in Products	Total Carbon Mass in Stand and Products
yr	t	t	t	t	t
EstYear	EstTreeCM	EstDebrCM	EstSoilCM	EstPrdCM	
1980	136	138	28	0	**302**
1981	147	154	31	0	**332**
1982	213	155	35	0	**404**
1983	318	160	40	0	**518**
1984	450	176	45	0	**671**
1985	840	440	99	0	**1,380**
1986	1,030	503	113	0	**1,646**
1987	1,331	544	130	0	**2,005**
1988	1,710	597	150	0	**2,457**
1989	2,148	669	173	0	**2,990**
1990	2,362	886	200	143	**3,591**
1991	2,918	937	238	83	**4,176**
1992	1,666	1,701	367	512	**4,245**
1993	2,061	1,584	427	402	**4,474**
1994	2,511	1,522	483	353	**4,868**
1995	2,536	1,722	537	564	**5,359**
1996	3,124	1,642	602	432	**5,800**
1997	552	2,159	1,185	1,152	**5,048**
1998	815	1,904	1,255	945	**4,918**
1999	1,155	1,731	1,313	845	**5,045**
2000	1,557	1,625	1,365	769	**5,317**
2001	2,008	1,572	1,413	710	**5,703**
2002	2,239	100	2,170	801	**5,309**
2003	2,801	363	2,168	704	**6,036**
2004	3,388	594	2,179	659	**6,821**
2005	3,998	451	2,235	623	**7,306**
2006	4,627	744	2,249	592	**8,213**
2007	4,247	653	2,400	1,132	**8,432**
2008	2,673	1,833	2,516	1,464	**8,487**
2009	3,176	1,785	2,570	1,262	**8,793**
2010	3,718	1,167	2,679	1,150	**8,715**
2011	4,292	1,368	2,702	1,063	**9,426**
2012	3,902	1,960	2,738	1,558	**10,158**
2013	552	3,560	2,963	2,292	**9,367**
2014	815	3,102	3,060	1,967	**8,944**
2015	1,155	2,767	3,138	1,792	**8,853**
2016	1,557	2,528	3,205	1,656	**8,946**
2017	2,008	2,364	3,264	1,547	**9,183**
2018	2,239	2,379	3,319	1,598	**9,534**
2019	2,801	2,258	3,378	1,466	**9,904**
2020	3,388	2,196	3,435	1,391	**10,411**
2021	3,998	2,173	3,492	1,328	**10,991**
2022	4,627	2,177	3,551	1,273	**11,629**
2023	2,223	2,973	3,858	2,254	**11,307**
2024	2,724	2,667	3,944	1,781	**11,116**
2025	3,263	2,473	4,017	1,645	**11,399**
2026	3,834	2,359	4,084	1,538	**11,816**
2027	4,431	2,303	4,147	1,453	**12,334**
2028	552	3,255	4,636	2,747	**11,190**
2029	815	2,834	4,718	2,118	**10,485**
2030	1,155	2,530	4,783	1,935	**10,403**

AUSTRALIAN Greenhouse Office

Estate Summary Table

Estate	
Name	Example of an estate
Notes	This is an estate.
Number of Stands	2
Number of Stand Type Groups	1
Total Area (ha)	205
Estate Start Year	1980

Input Data: Estate Information

Key

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AUSTRALIAN Greenhouse Office

Estate

Carbon Masses in Special Years

Carbon Masses in Years of Special Interest

Year	Row Index	Carbon Mass in Trees	Carbon Mass in Debris	Carbon Mass in Soil	Carbon Mass in Products	Total Carbon Mass in Stand and Products
yr		t	t	t	t	t
1980	1	136	138	28	0	**302**
1995	16	2,536	1,722	537	564	**5,359**
2000	21	1,557	1,625	1,365	769	**5,317**
2008	29	2,673	1,833	2,216	1,764	**8,487**
2009	30	3,176	1,885	2,270	1,662	**8,993**
2010	31	3,718	1,967	2,279	1,750	**8,715**
2011	32	4,292	1,968	2,302	1,863	**9,426**
2012	33	3,902	1,960	2,338	1,958	**10,158**
2020	41	3,888	2,196	3,235	1,091	**10,411**
2100	121	5,825	2,196	11,245	7,826	**28,092**

CAMFor will calculate Carbon masses for the estate for any user-defined year of interest

Total for stand type group in 2000

Input Data: Years of Interest

Key

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AUSTRALIAN Greenhouse Office

Estate
Carbon Masses

Carbon Masses

Year	Carbon Mass in Trees	Carbon Mass in Debris	Carbon Mass in Soil	Carbon Mass in Products	Total Carbon Mass in Stand and Products
yr	t	t	t	t	t
EstYear	EstTreeCM	EstDebrCM	EstSoilCM	EstPrdCM	
1980	136	138	28	0	**302**
1981	147	154	31	0	**332**
1982	213	155	35	0	**404**
1983	318	160	40	0	**518**
1984	[illegible]	[illegible]	[illegible]	[illegible]	**[illegible]**
1985	[illegible]	[illegible]	[illegible]	0	**1,[illegible]**
1986	1,[illegible]	[illegible]	[illegible]	0	**1,[illegible]**
1987	1,[illegible]	[illegible]	[illegible]	0	**2,[illegible]**
1988	1,[illegible]	[illegible]	[illegible]	0	**2,457**
1989	2,[illegible]	[illegible]	[illegible]	0	**2,990**
1990	2,[illegible]	[illegible]	[illegible]	[illegible]	**3,591**
1991	2,918	937	238	83	**4,176**
1992	1,666	1,701	367	512	**4,245**
1993	2,061	1,584	427	402	**4,474**
1994	2,511	1,522	483	353	**4,868**
1995	2,536	1,722	537	564	**5,359**
1996	3,124	1,642	602	432	**5,800**

Total for estate in 1983

Totals for estate components in 1983

Key

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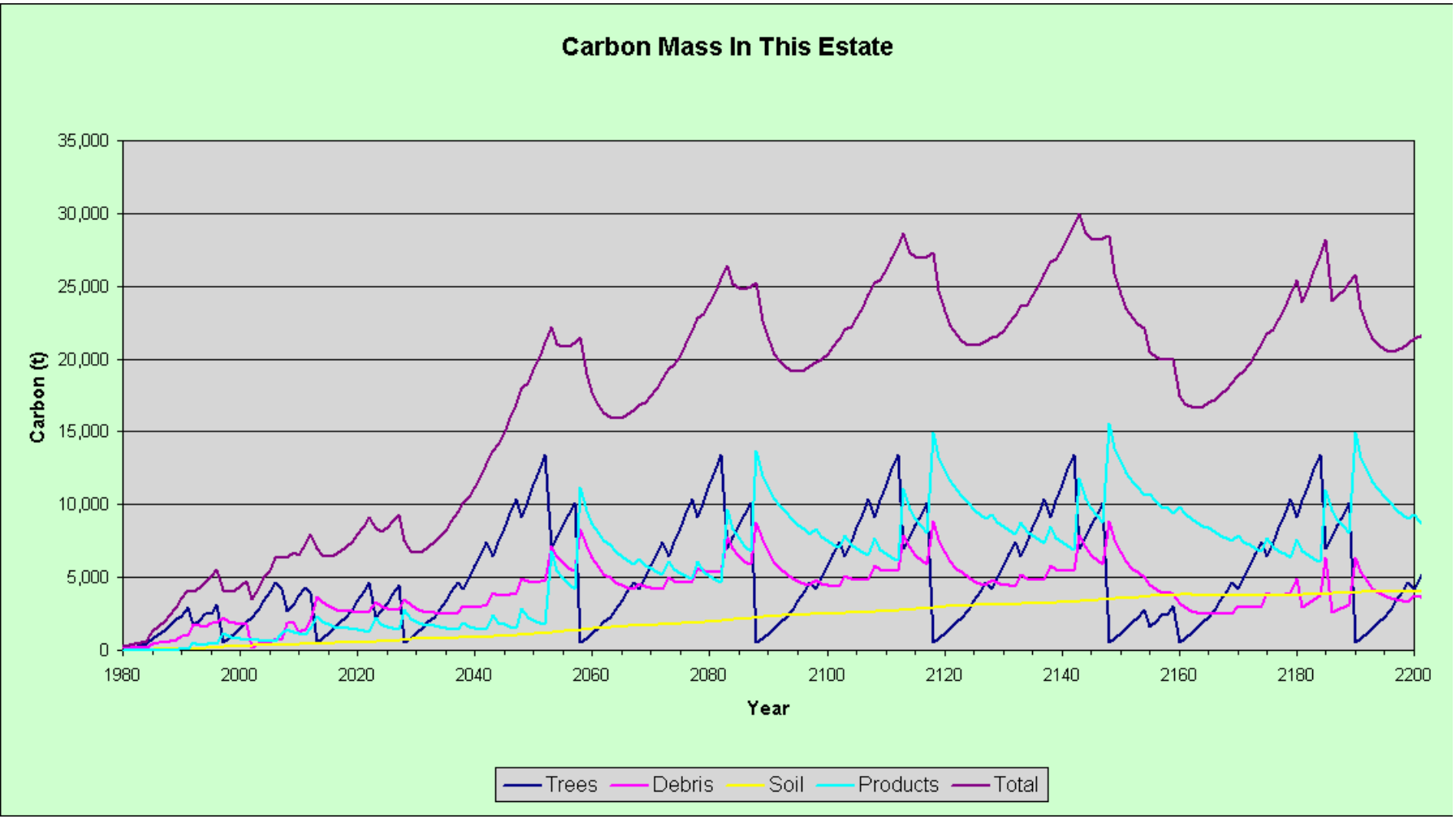
AUSTRALIAN Greenhouse Office

Estate

Carbon Mass Graphic



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