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Issues in Forestry Carbon Crediting

IEA Bioenergy Task 38 Workshop
Canberra, Australia
March 28-30, 2001

Doug Bradley
Domtar Inc.

Issues in Forestry Carbon Trading

- New Zealand workshop
- What is in/not in Kyoto
- Who is buying what credits
- Trading Issues
- Amortization
- Example projects
- Harvested Wood products
- What need to move forward

To Tai Toko Workshop- Feb 16-18

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To Tai Toko Workshop

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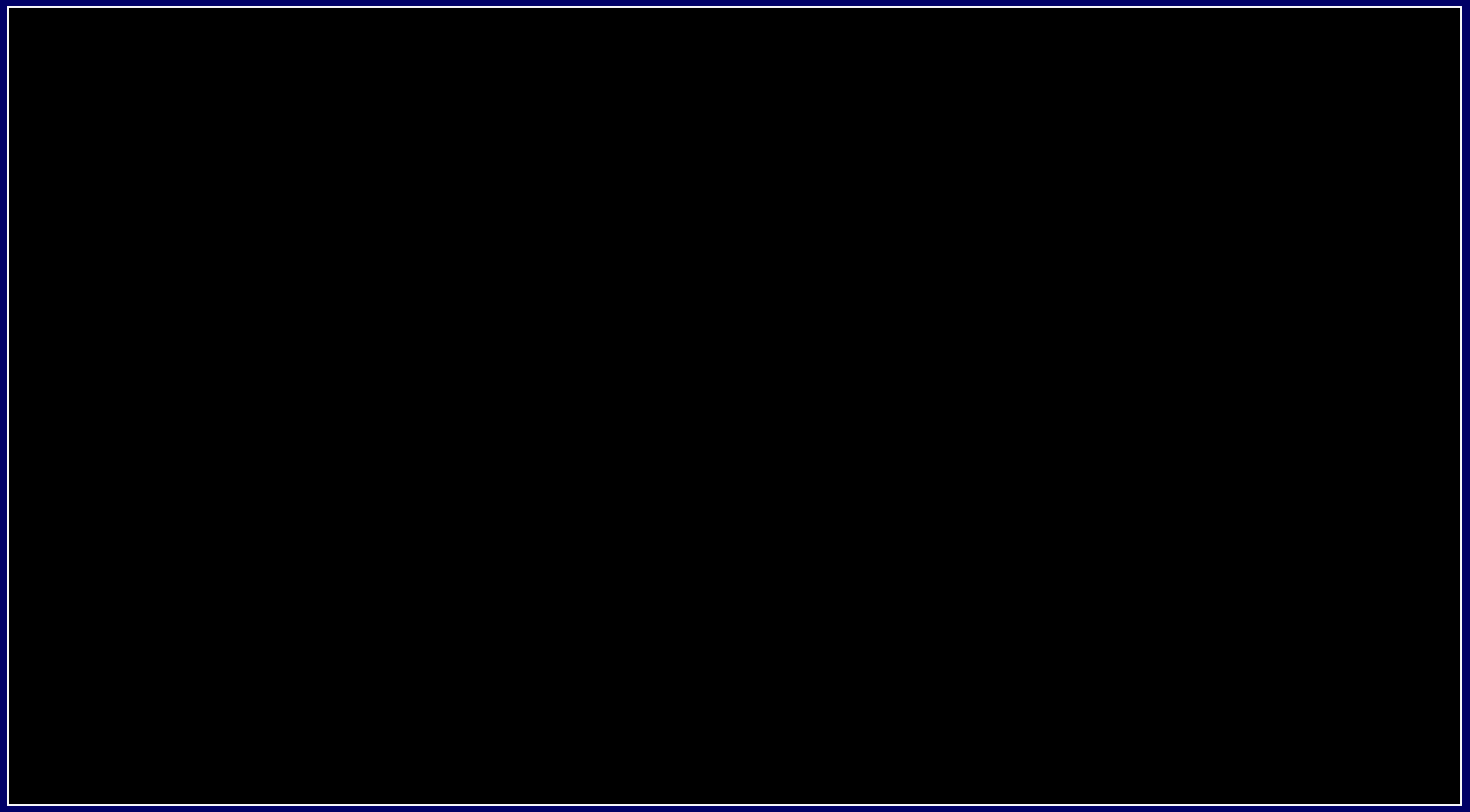
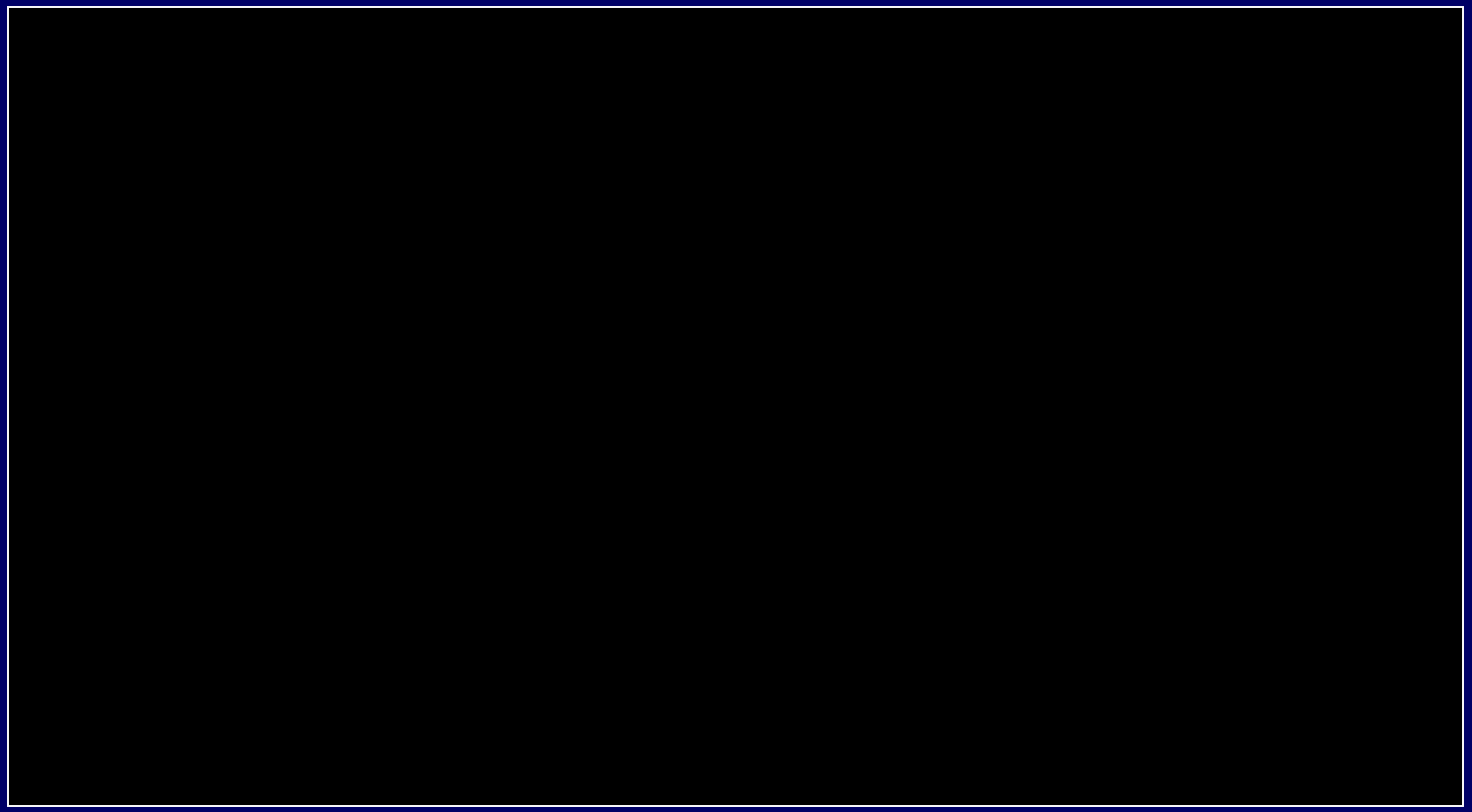
A sunny day in indigenous forest

Dinner at “Lodge Ford-Robertson”



Accommodation in “Garage Villa”



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Delegates watch river rise

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Raging To Tai Toko River

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A minor “slip”

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Escape to Freedom

Kyoto- In vs Not yet in

IN KYOTO			NOT YET IN KYOTO
Fossil Fuel Reduction		Carbon Sequestration	
Energy Efficiency	Fuel Switching (Biomass for fossil fuel)	Afforest., Reforest Deforestation	Other Forestry, Agricultural Activities
Reduce fossil fuel	Reduces fossil fuel	Sequesters carbon (defn. - Article 3.3)	Sequesters carbon (negotiated- Article 3.4)
Examples:			
-Fuel efficient motors -Waste heat capture -Prod'n enhancemt -Improved Maint.	-Wood waste cogen -Black liquor integrated gasific. and combined cycle cogen	-Planting on poor agric. land -Reducing deforestation	*Forestry*: -Pest and disease control -Fire control -Commercial thinning -Juvenile Spacing -Tree Improvment **- Reduc. impact logging** *Agricultural*: **-Reduced tillage** -Manure management -Shelterbelts

Who is buying what?

- Ontario Power Gen
- BC Hydro

- Seattle City Light
- TransAlta

- Gemco

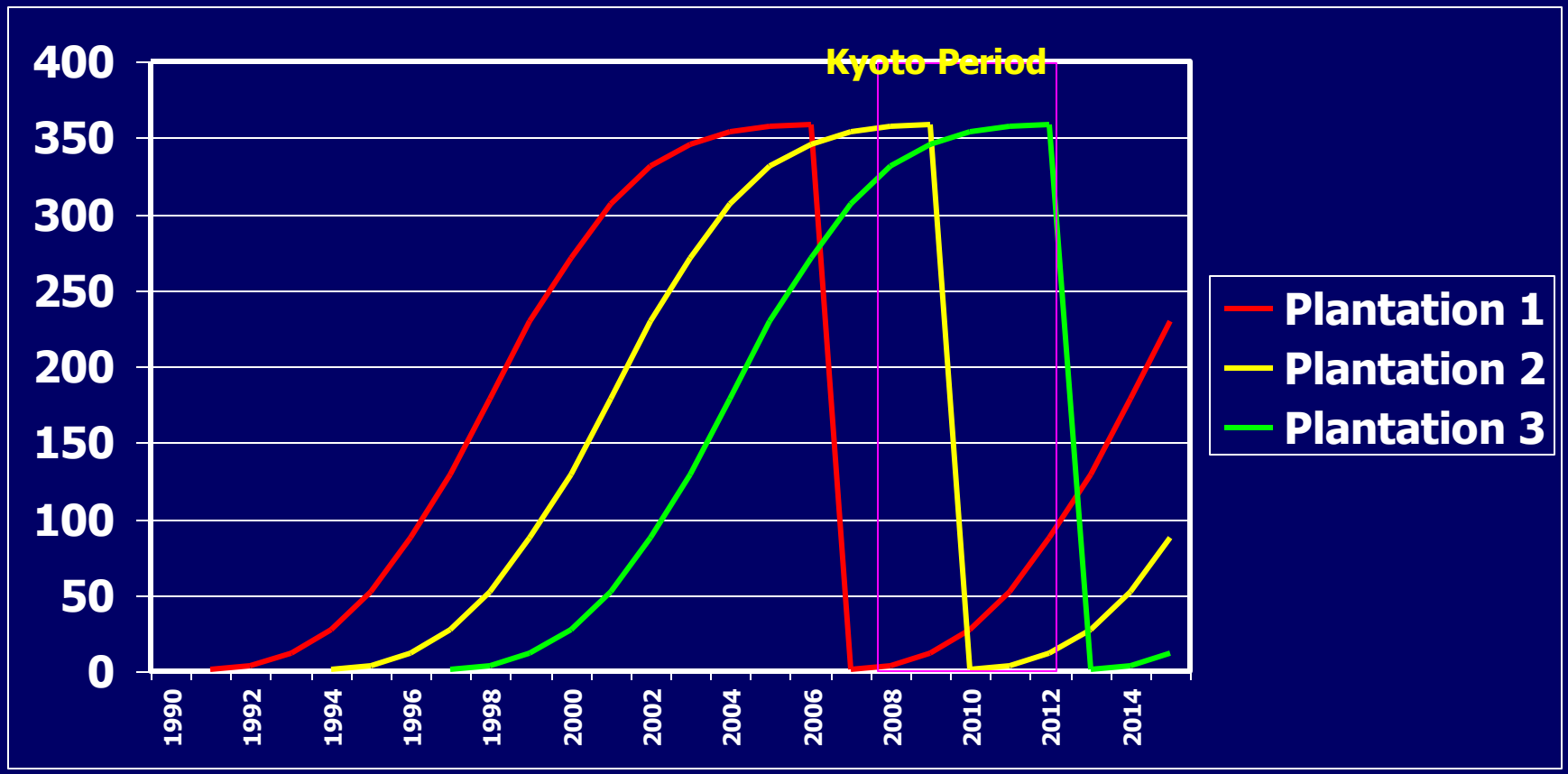
- All sinks- if thru PERT
- No sequestration, no business as usual
- Sequestration- Kyoto only
- Sequestration- Kyoto- no conservation or forest mgt (1.Can 2.Aus, 3.NZ 4.US…)
- Sinks including agriculture

Trading Issues

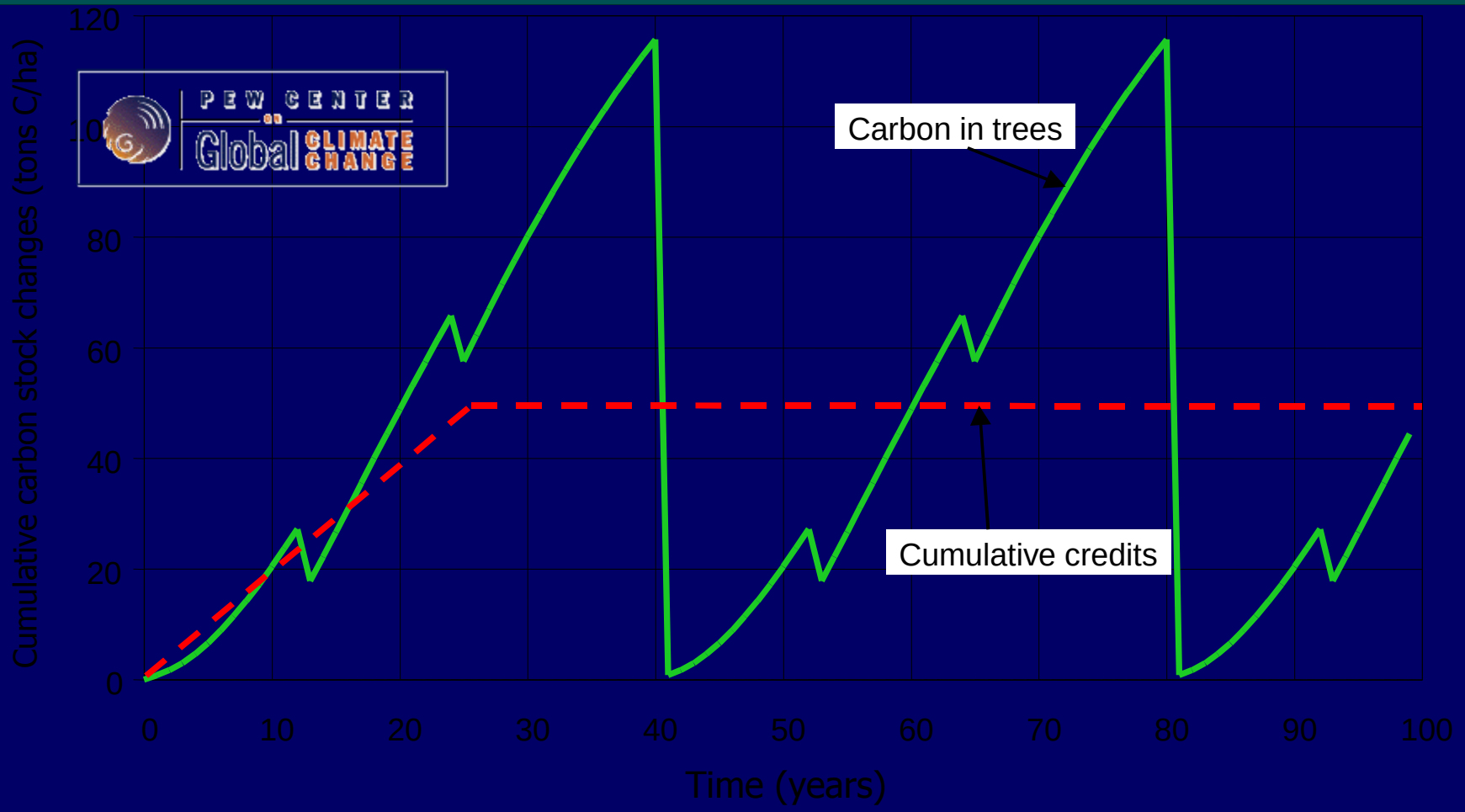
Lack of clear guidelines is holding up action

- *In Kyoto vs not*
- "Business as Usual"
- Discounting
- Harvested wood products
- First commitment period

Implications of Commitment Period



Possible Accounting Method
Use of Amortization



Carbon Impacts of Sequestration Activities

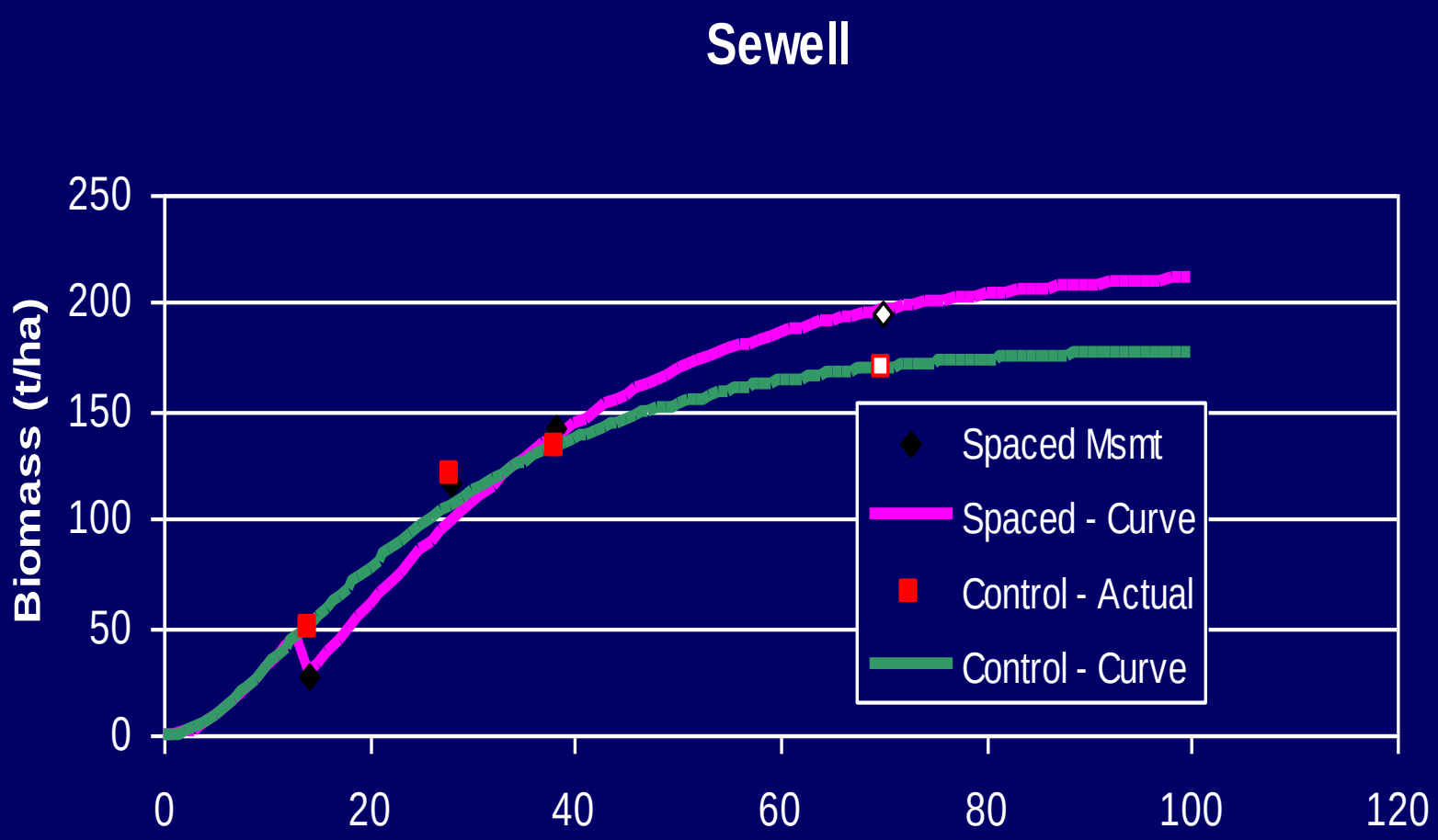
	Initial	Long Term
Forestry:		
Afforestation	sequestr.	sequestr
Pest spray	sequestr.	sequestr.
Tree Improvement	sequestr.	sequestr.
Juvenile spacing	emission	sequestr.
Commercial thinning	emission	sequestr.
Fertilization	emission	sequestr.
Other:		
Landfill Incineration	emission	sequestr.

Pre-commercial Thinning (Juvenile Spacing)

Unthinned

Thinned

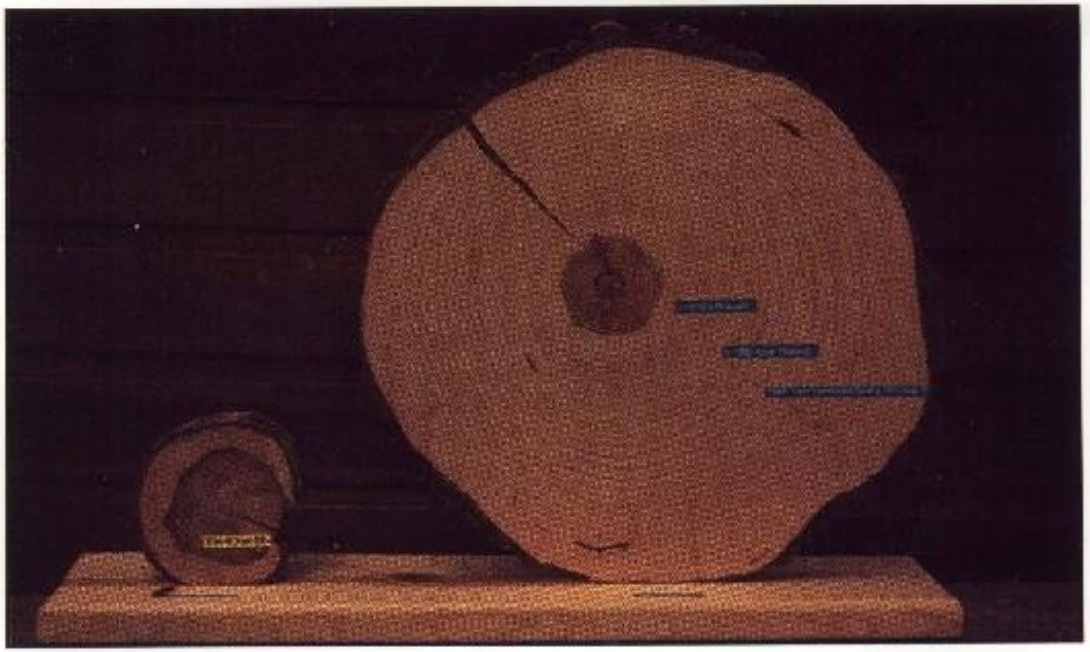
Yield Curve
Natural vs Spaced



Impact of forest management

New Federal Forestry is the science of forestry.

Sounds like common sense to us.

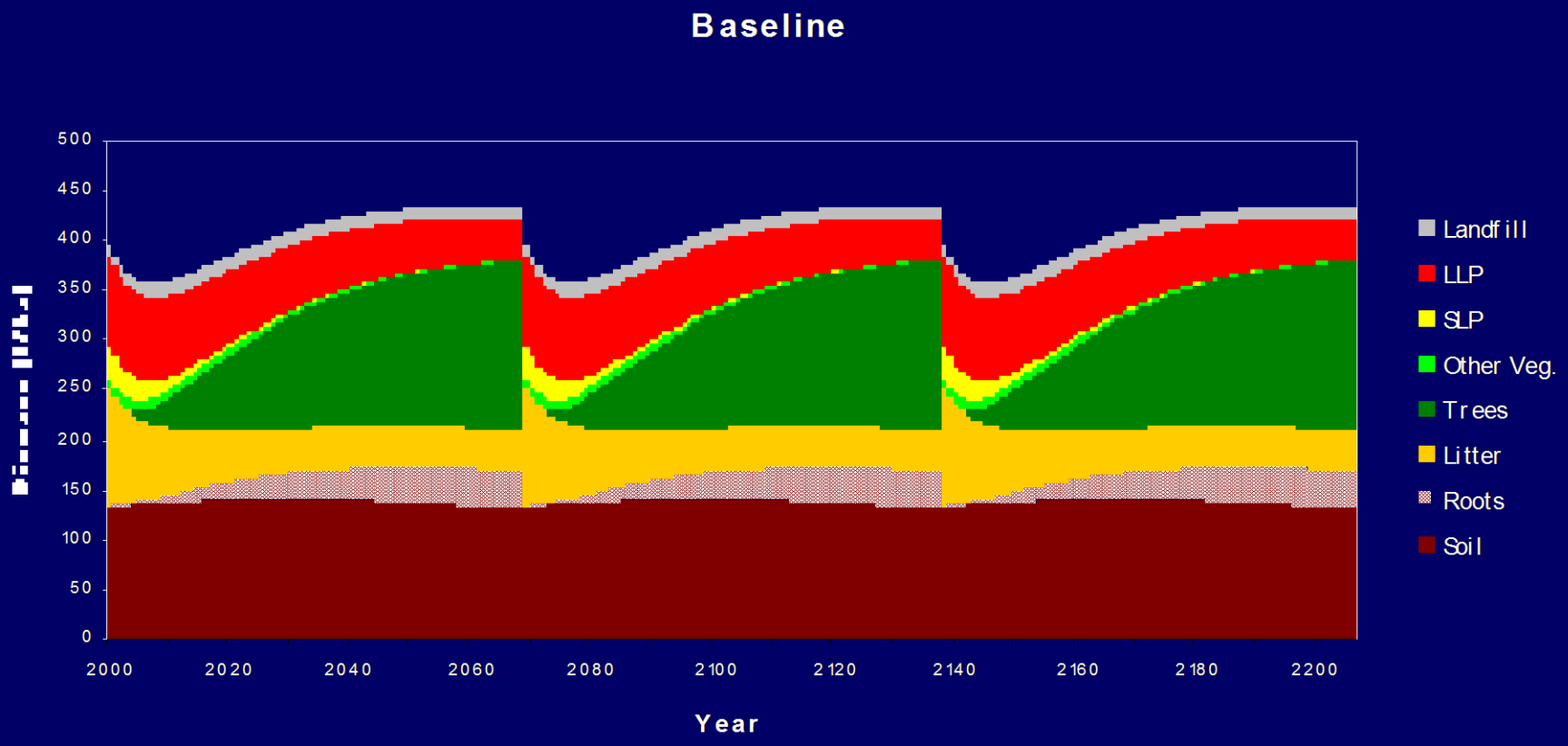


This photo shows how trees thrive in a well-managed forest. The cross-section at left is from an overcrowded stand and was 190 years old when it was harvested. The cross-section at right is from a well-managed forest and was 80 years old when harvested.

Natural Jack Pine Forest (Baseline)

Forest and Products Carbon Pools

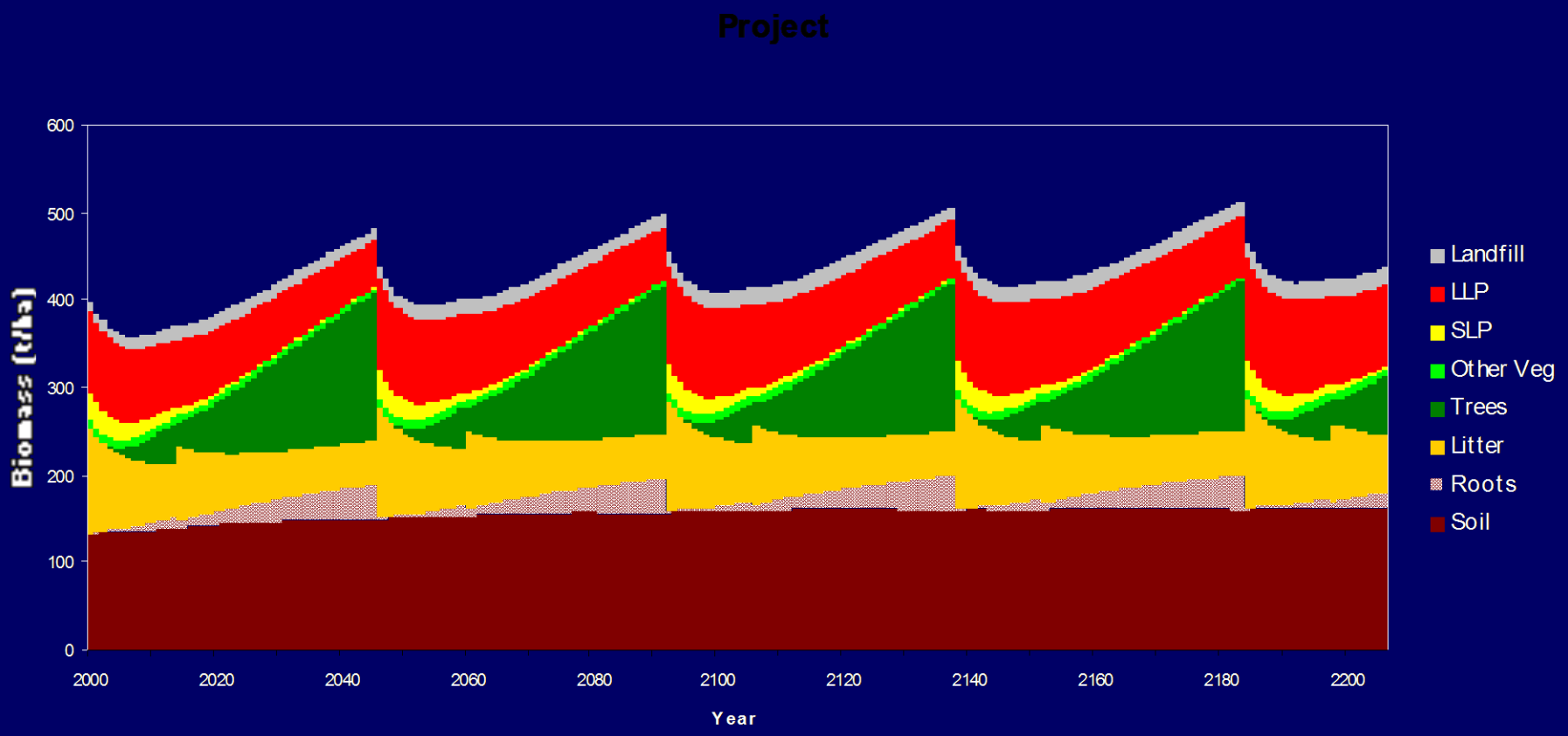
Gorcam model



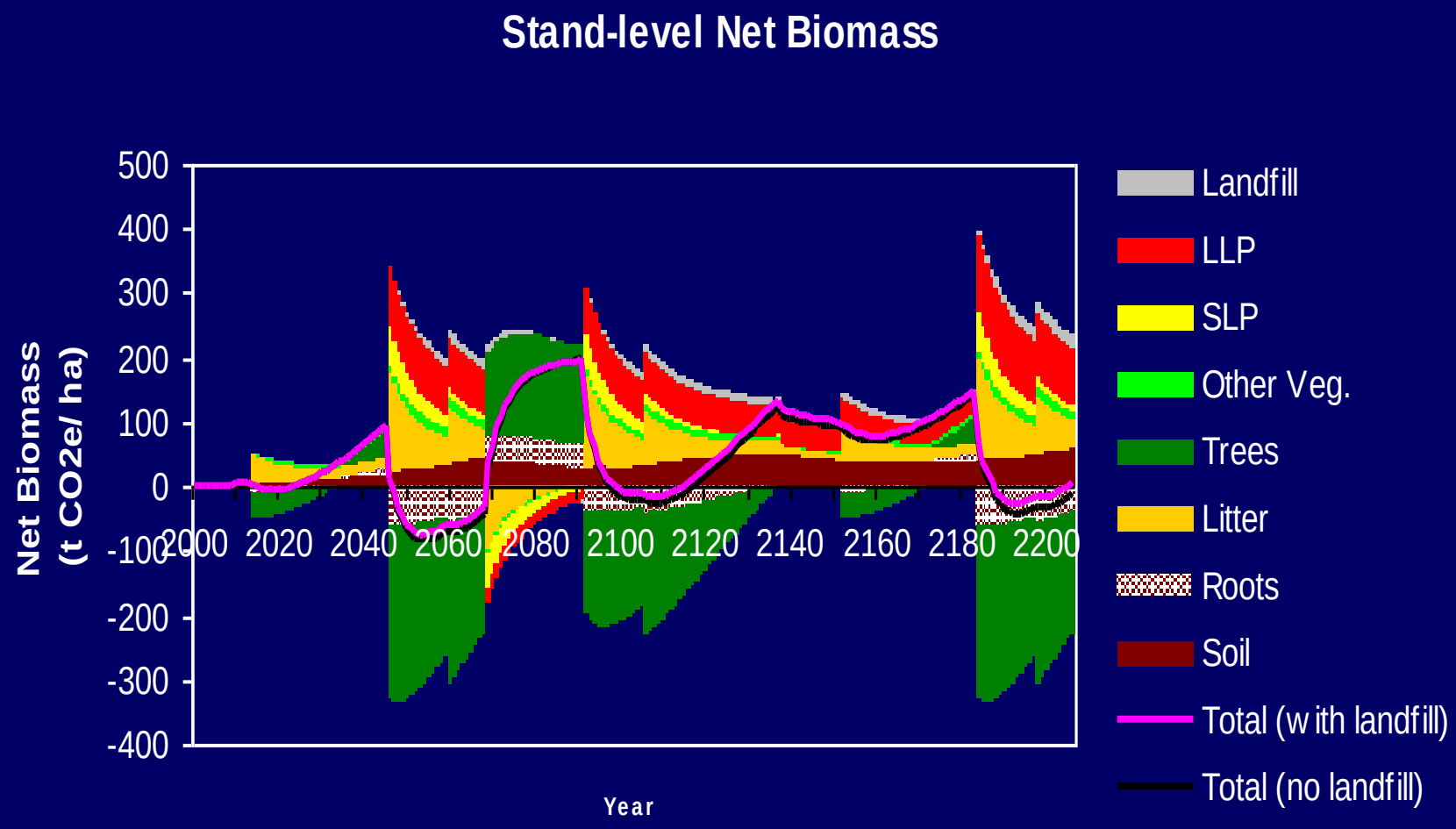
Juvenile Spaced Stand

Forest and Products Carbon Pools

Gorcam Model



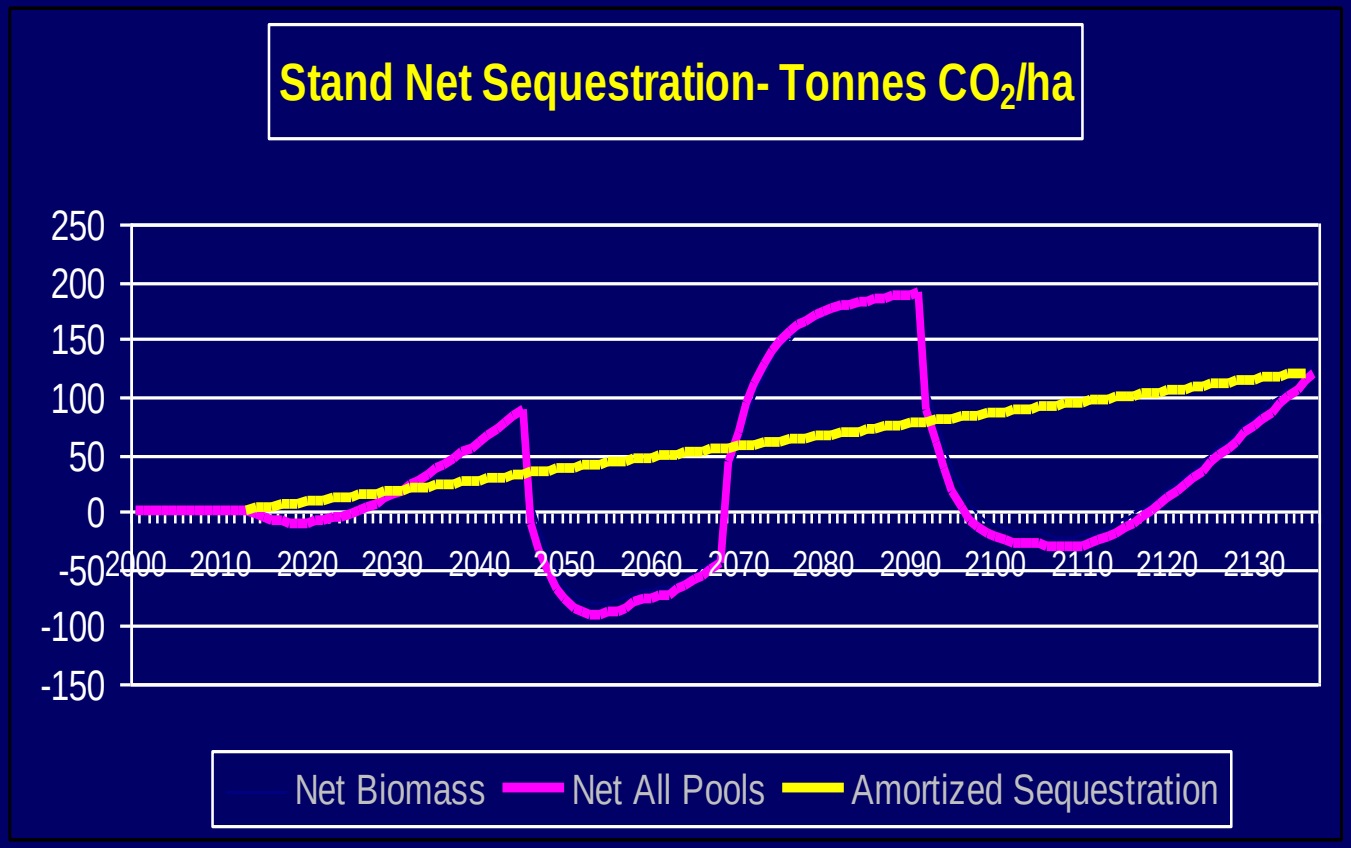
Net Emissions
Control vs Spaced *Gorcam Model*



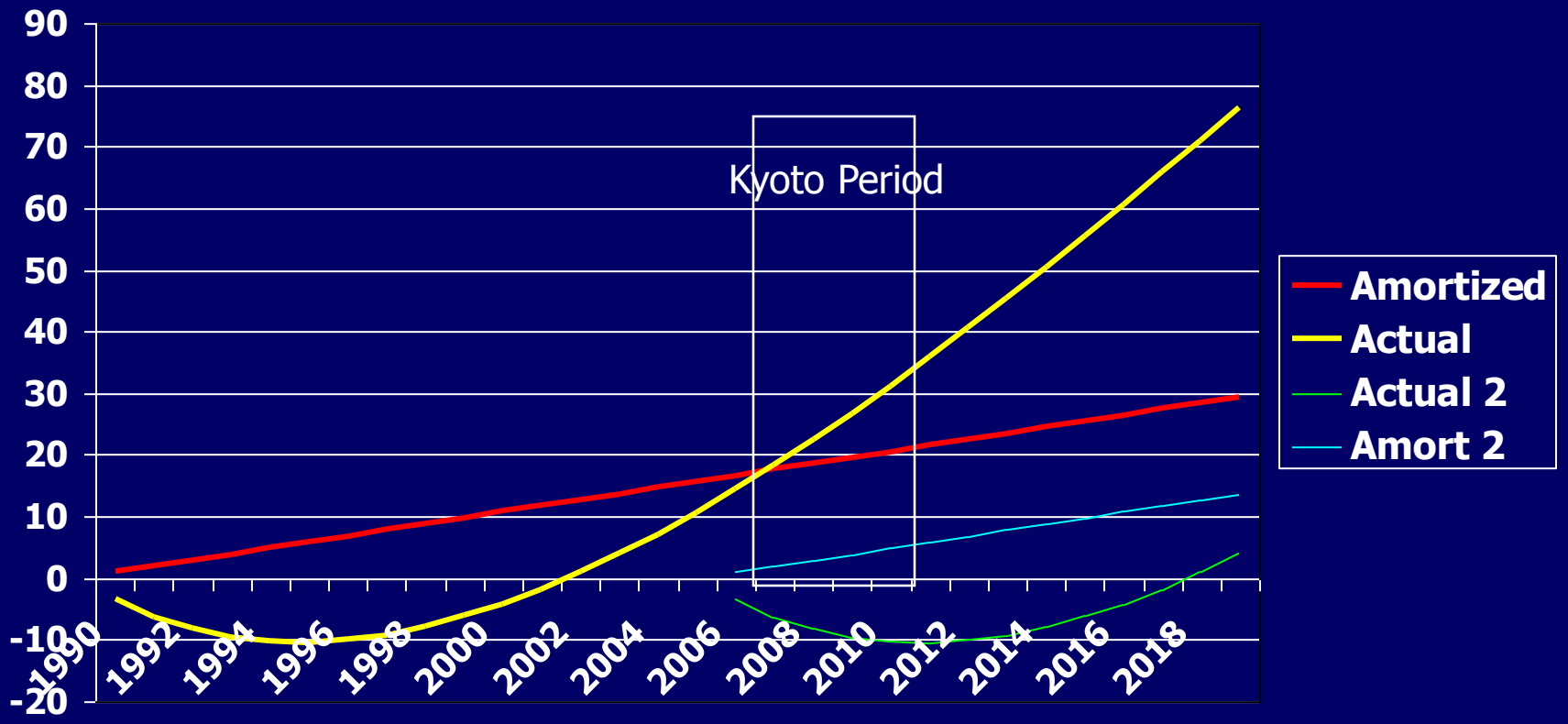
Stand Sequestration

Annual Crediting

Gorcam Model



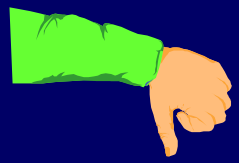
Actual vs Amortized Sequestration Cumulative
(tonnes CO_2e/ha)



New Concept- Phases of Acceptance

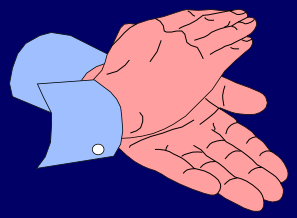
Concept- "Give credit for long term benefit even if short term emission"

- ***Utterly ridiculous!***



- *Violently opposed!*

- Accepted and felt to be always self-evident

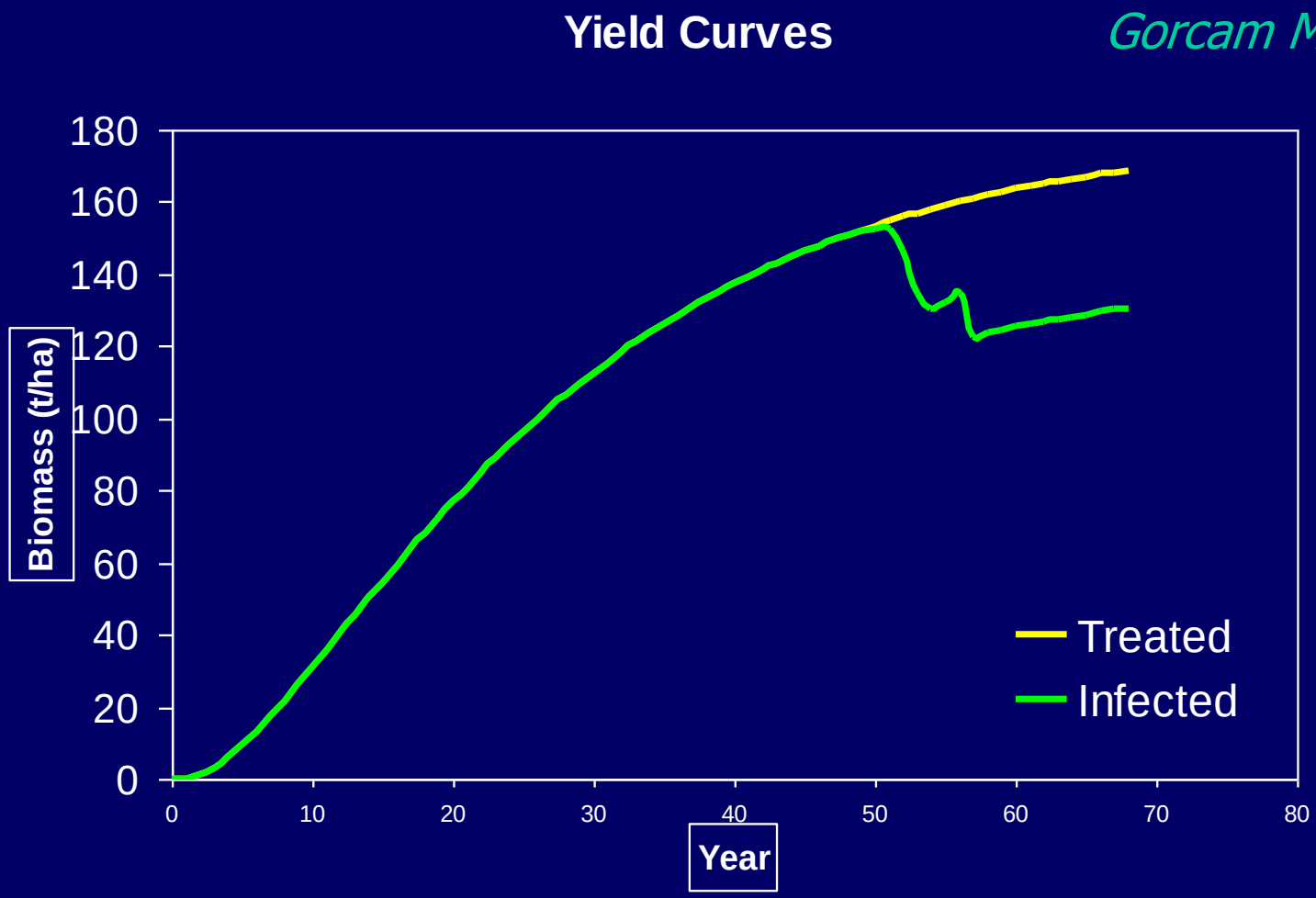


Jack Pine Bud Worm Spray Program

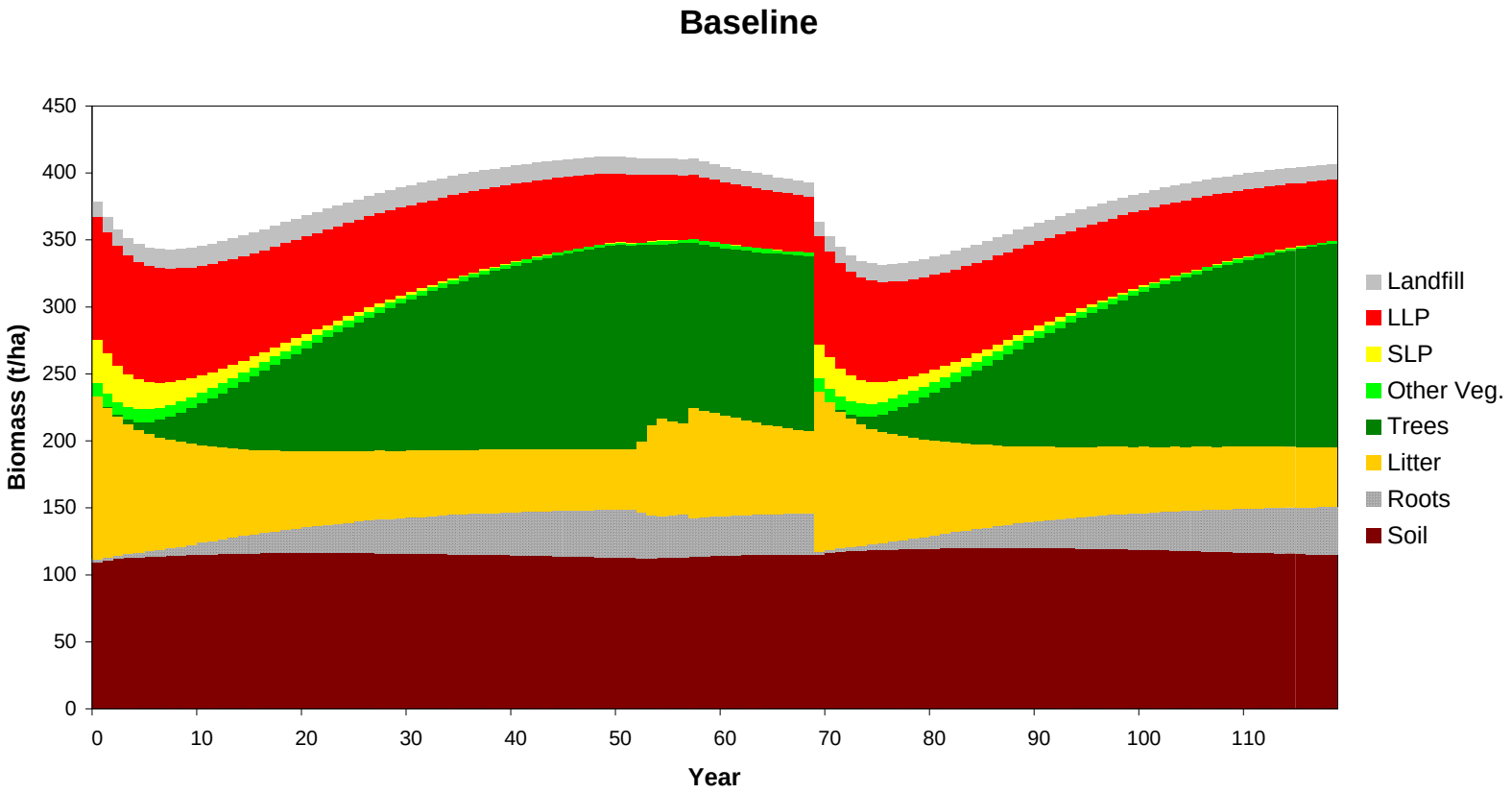
- Epidemics cycle 5-7 years
- Result in tree mortality, growth loss
- Assumptions
  - 17% outright mortality- years 2-4
  - 10% less growth p.a. – years 2-6
  - 10% mortality due to top kill- year 7

Bud Worm Spray Program

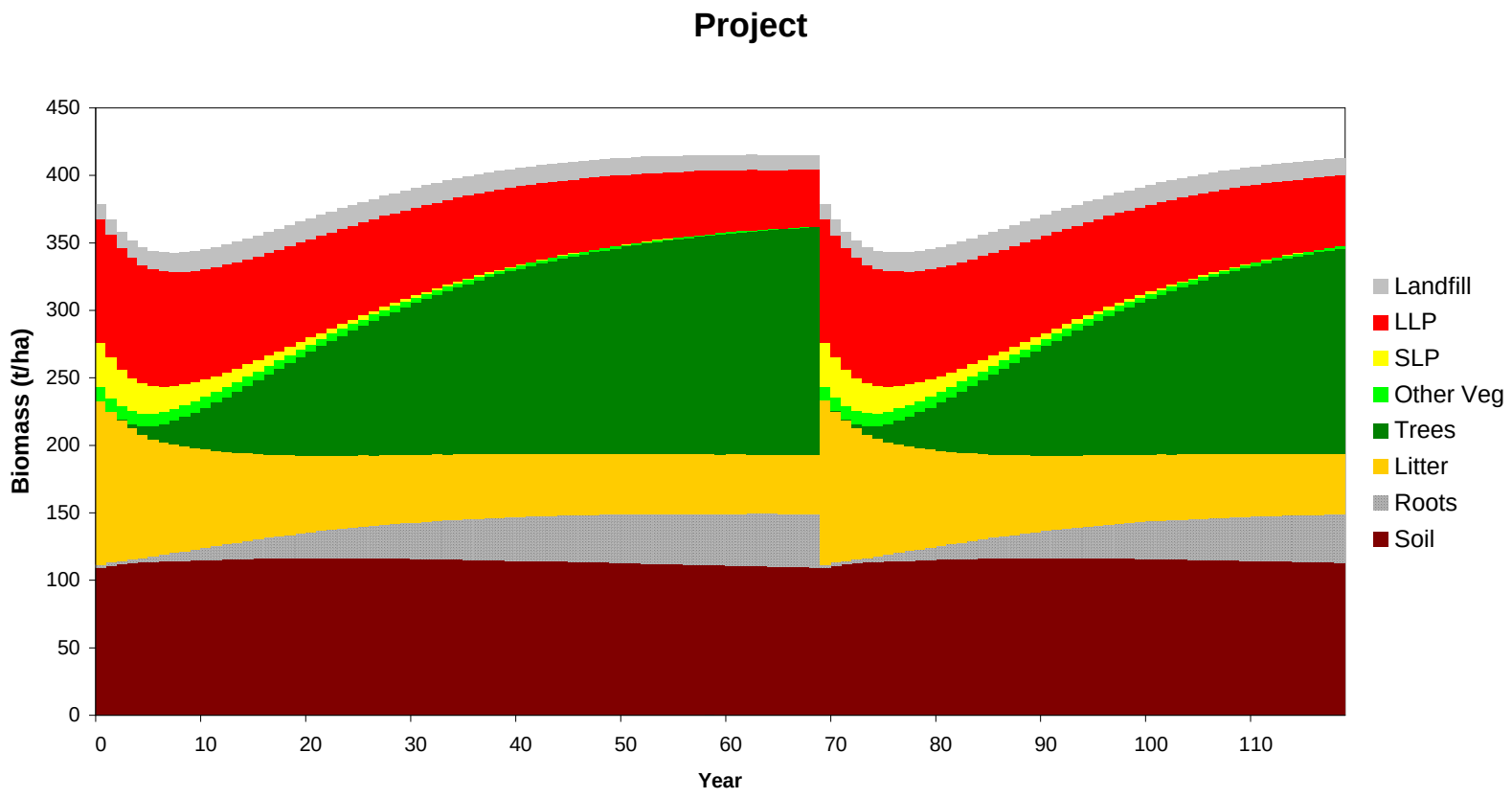
Stand Level Biomass



Biomass with JPBW Attack

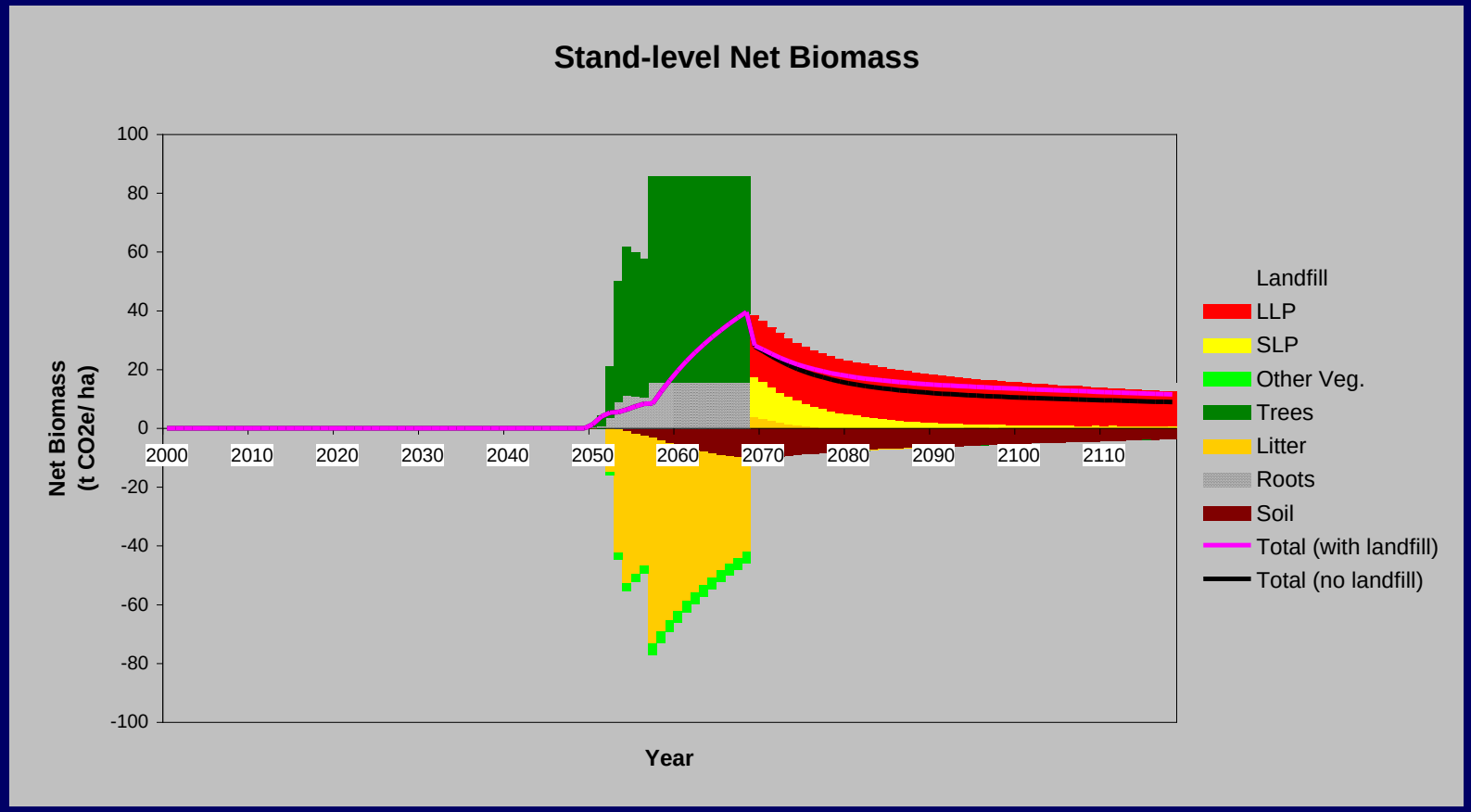


Biomass with JPBW Suppression



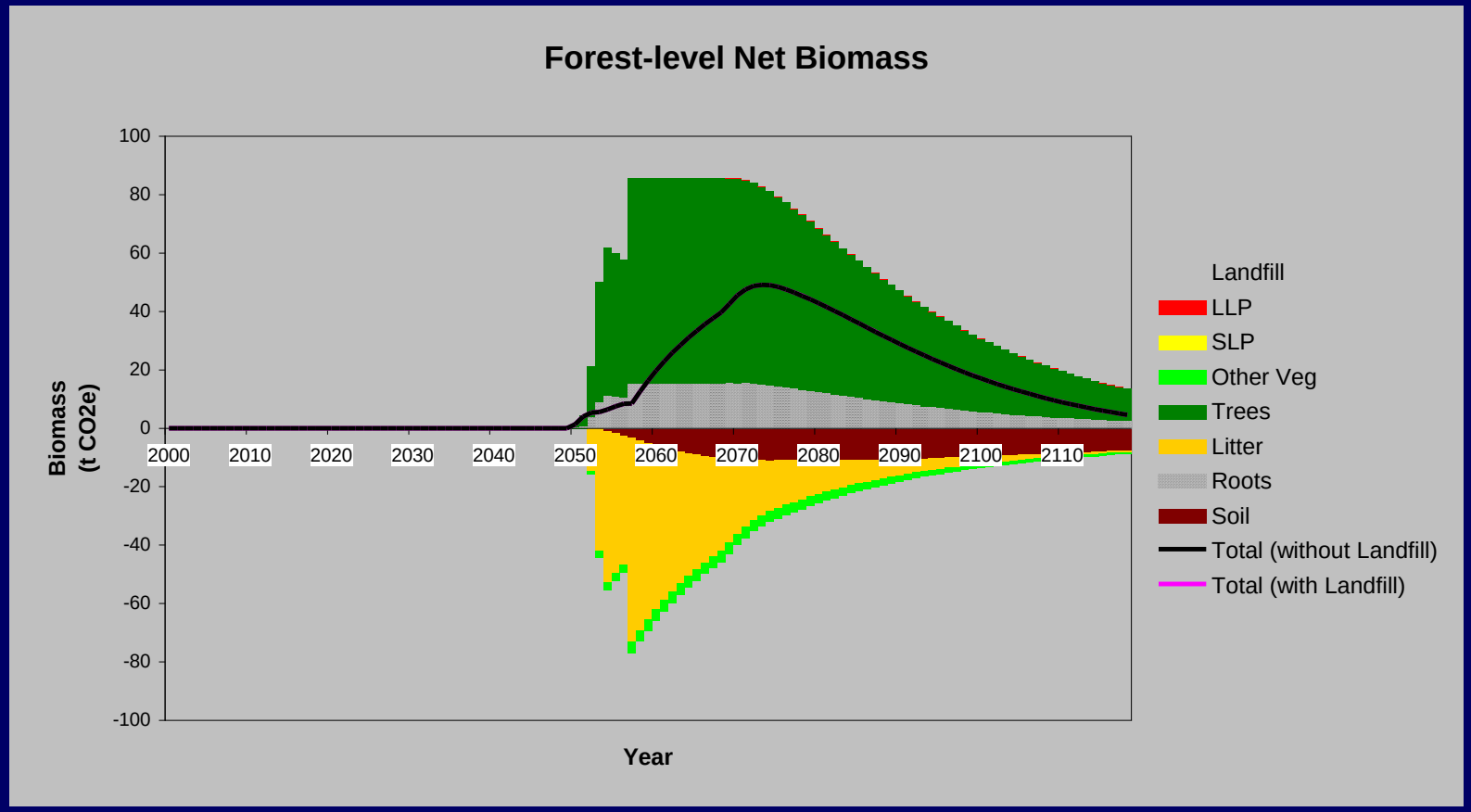
Bud Worm Spray Program *Gorcam Model*

Stand Level

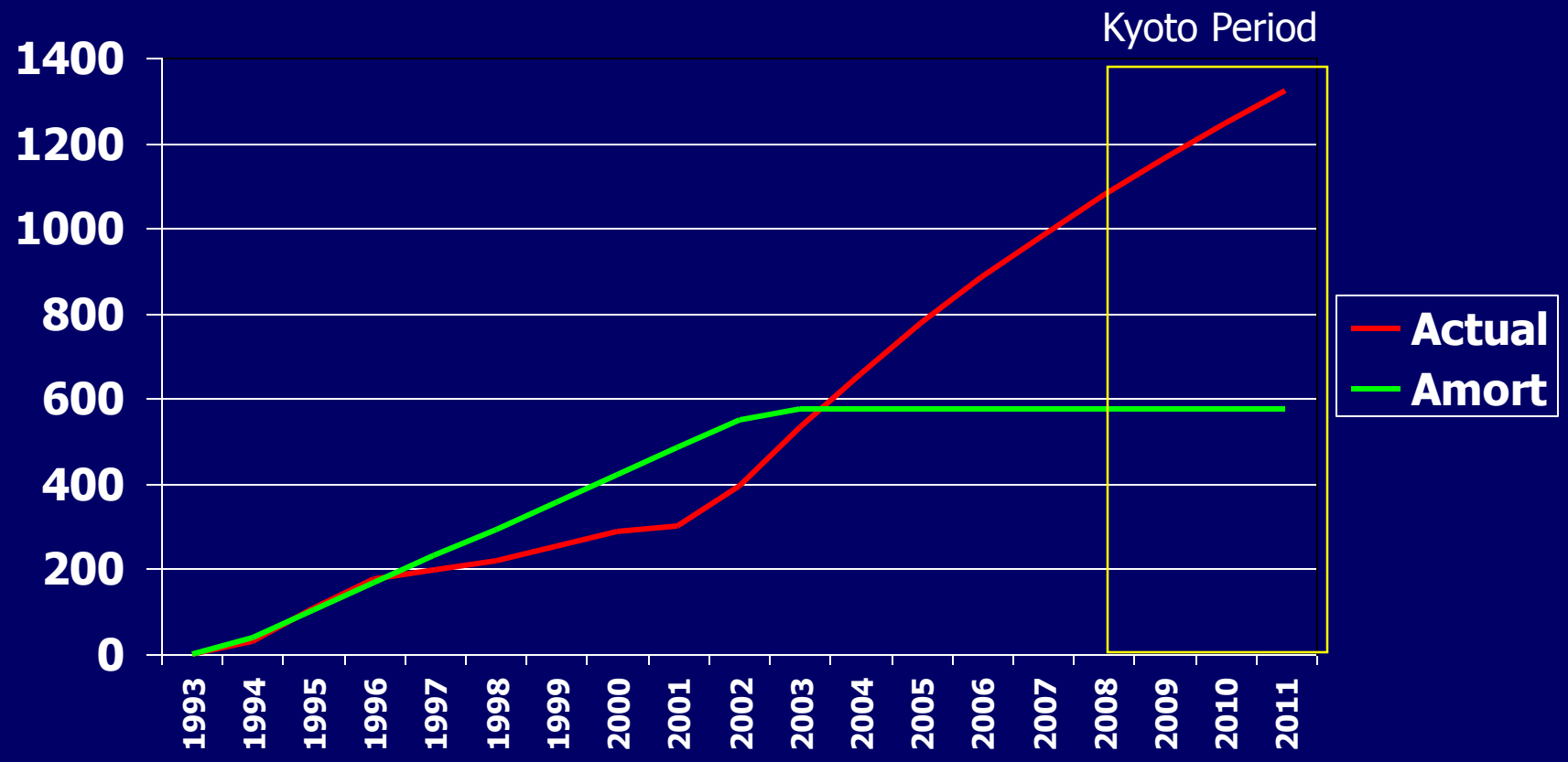


Bud Worm Spray Program

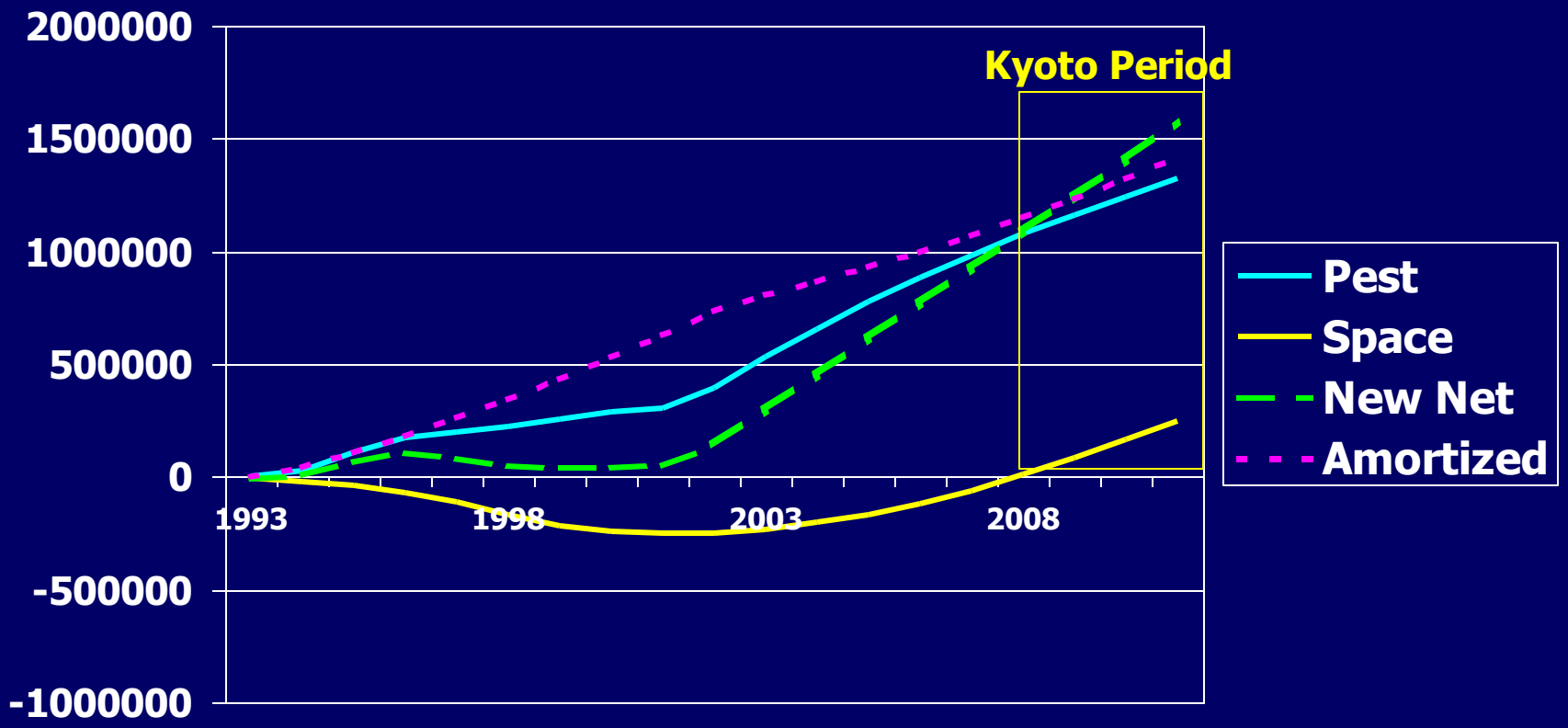
Gorcam Model



Pest Control Carbon Balance



Combined Spray-Spacing in Carbon "Pool"

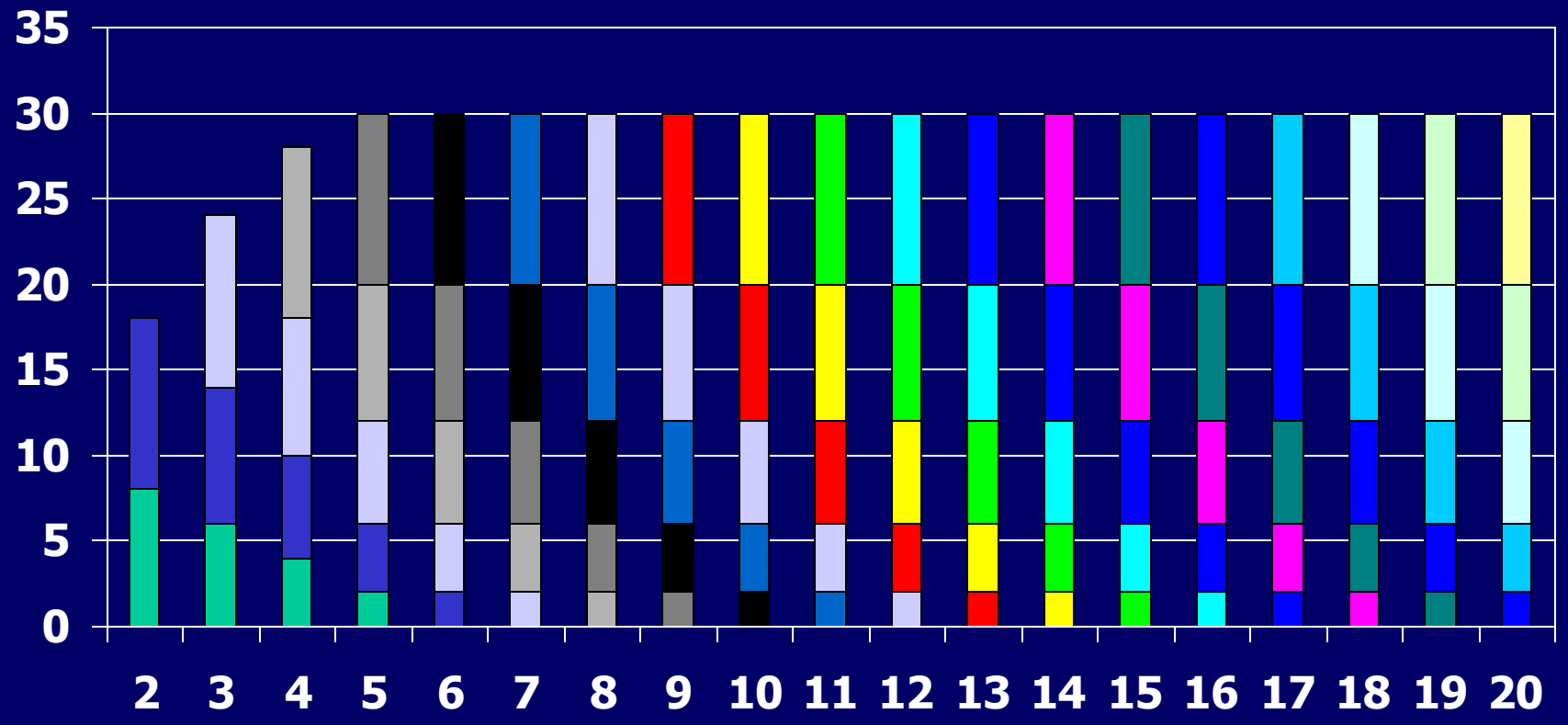


Domtar Wood Products Parameters

- Harvest (Domtar operations)
  - Biofuel 26%, short-lived 19%, long-lived 30%, landfill <1%, on-site waste 25%
- Wood Products
  - Short-lived
    - Avg lifetime 5 years
    - Biofuel 25%, compost 15%, landfill 10%, recycled 50%
  - Long-lived
    - Avg lifetime 30 years
    - Biofuels 25%, landfill 10%, recycled 65%
- Landfill
  - Average lifetime- 42 years

Wood Products Carbon

5 yr decay



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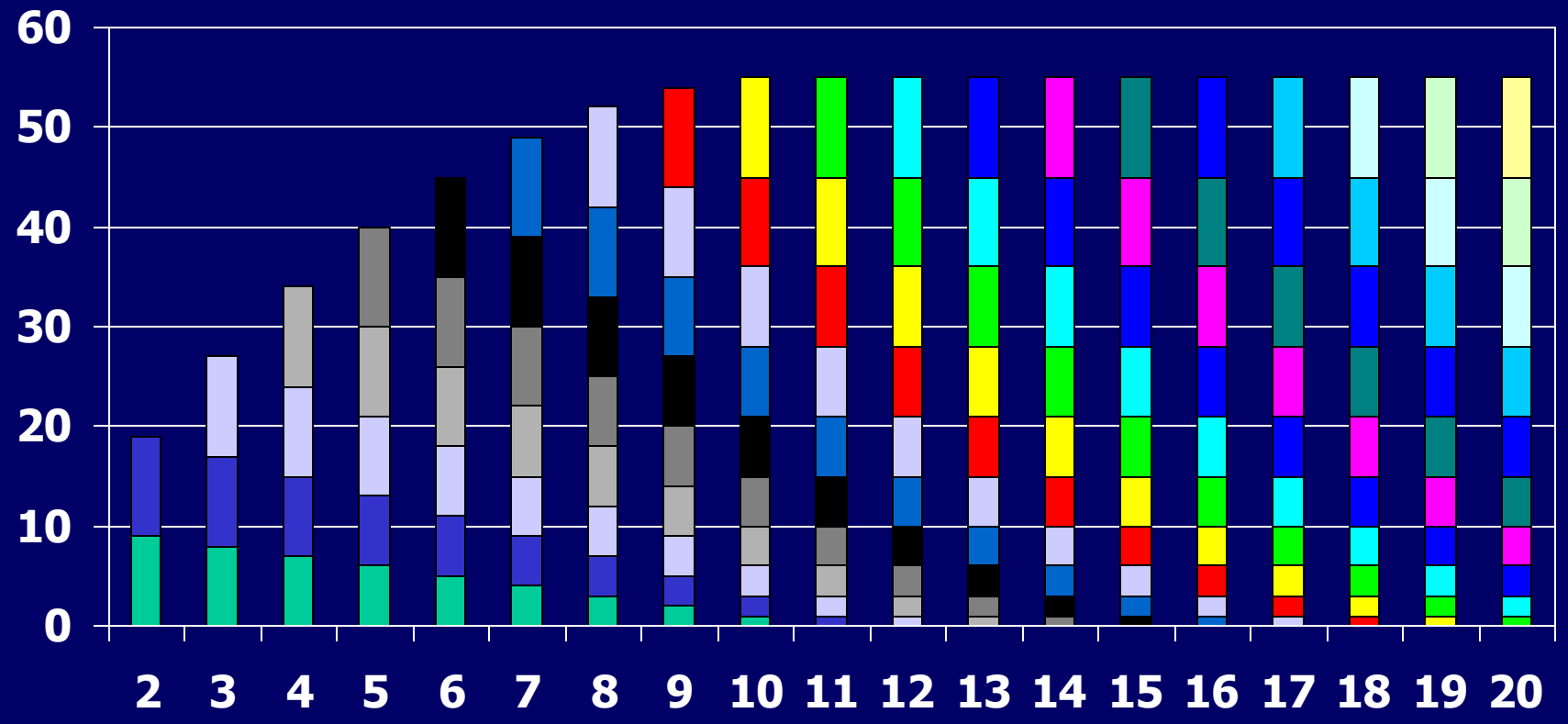
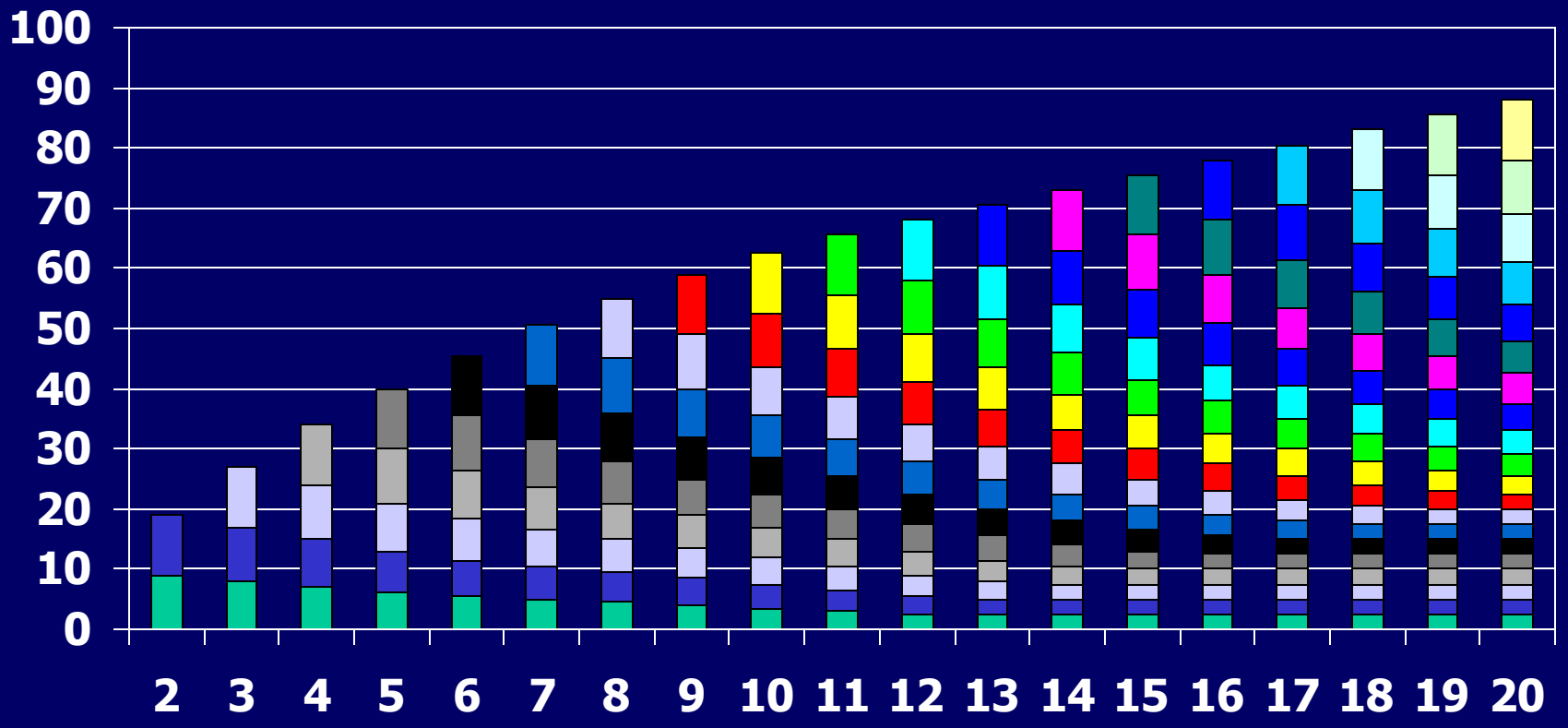
Wood Products Carbon

10 yr decay



Wood Products-

Ken Skog- USDA Forestry- decay estimates



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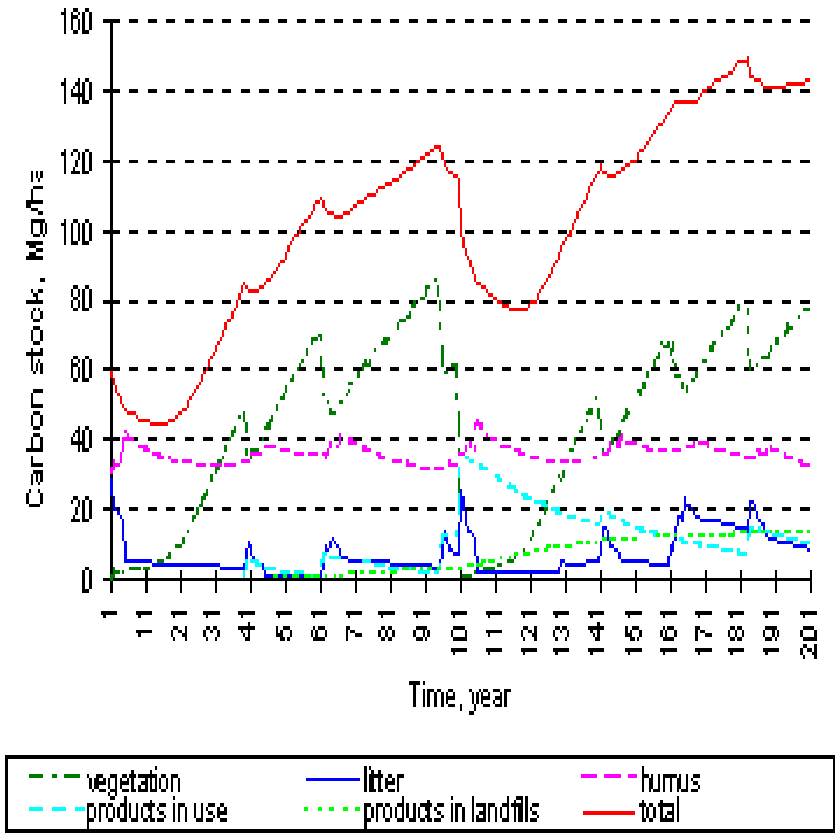
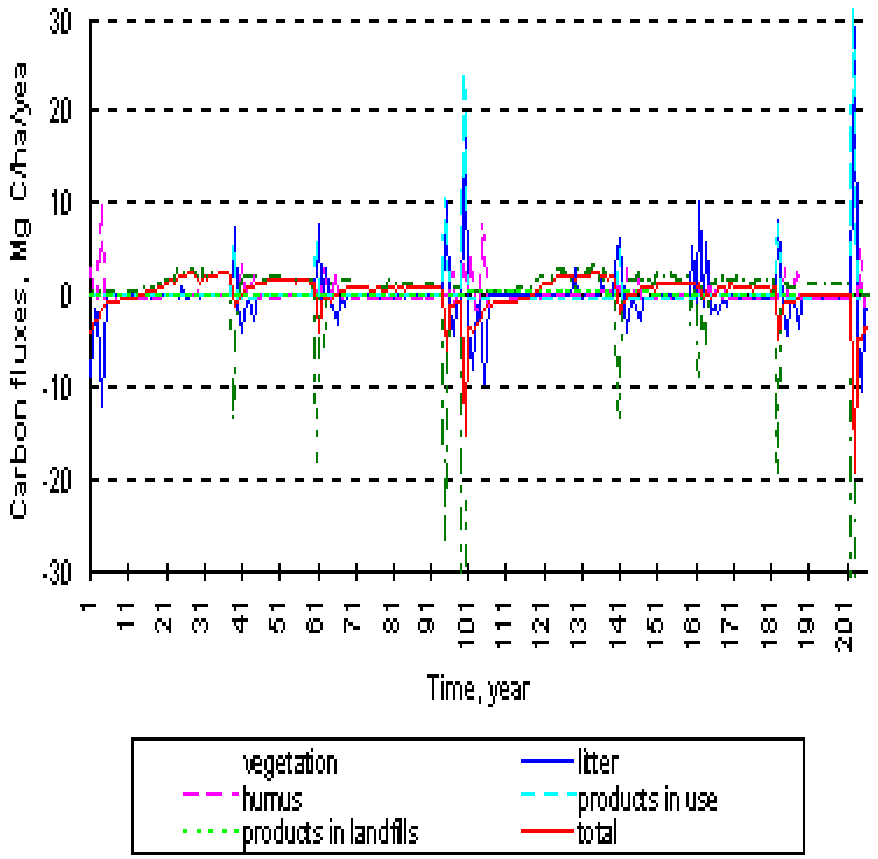
European Forest Institute

Carbon Balance Implications of ....Wood Products

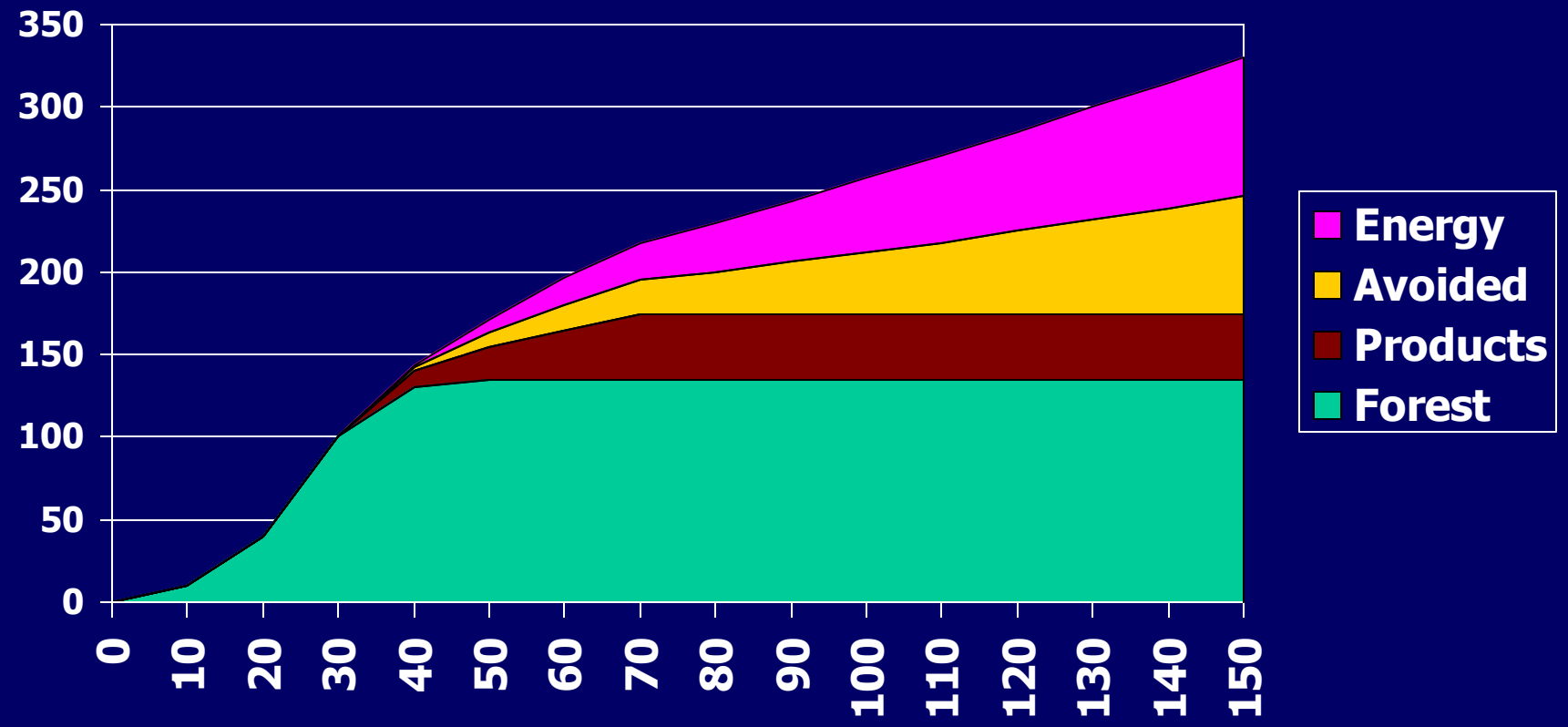
a)



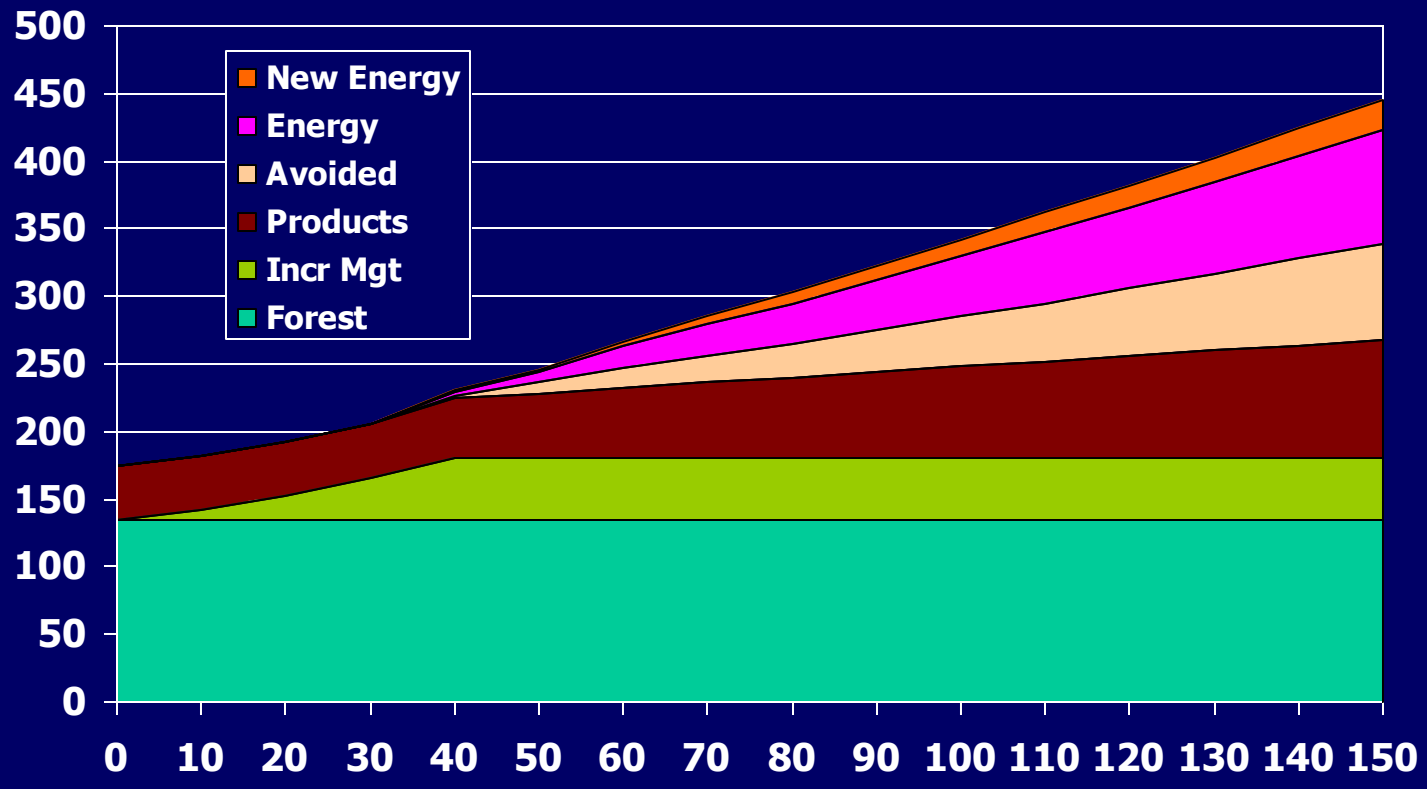
b)



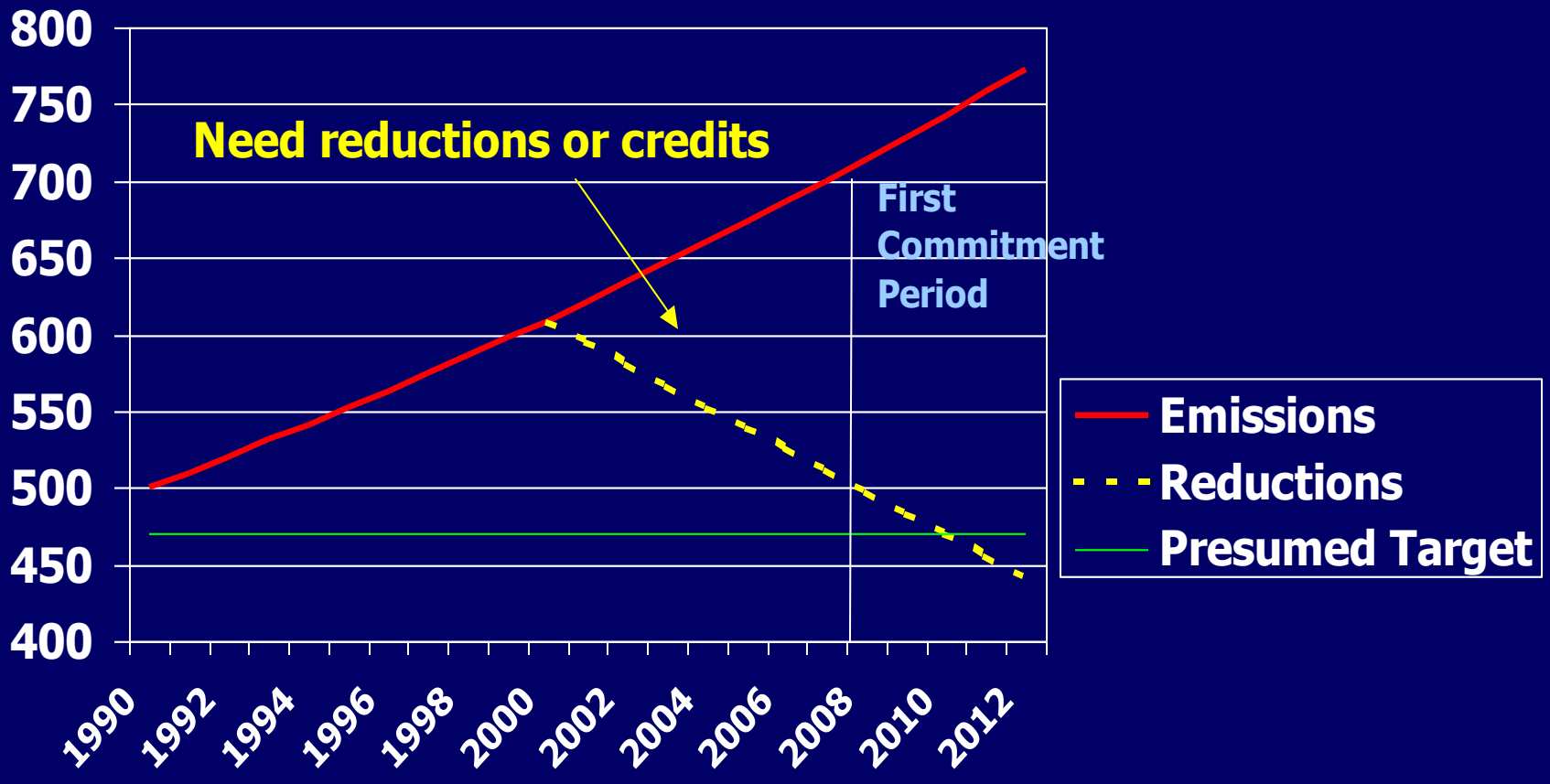
Life Cycle- NZ Plantation Forest



Existing Forest Intensively Managed



Carbon Credit Market



Current Pricing

	Low	High	Deal
Cantor Fitzgerald	$0.77	$3.09	
Gemco	$1.00	$1.50	
SaskPower			$0.83

What do we want to happen?

- Increase use of biomass
  - biofuel, biochemicals….
- Increase amount of biomass
  - Eg. through intensive forest management
- Increase demand for wood

How can this happen?

Domtar Incentives to promote forest carbon sequestration

- Forest management *in Kyoto*
- Standard accounting system
- Acceptance of forest measurement methods (periodic sample plots)
- Amortization methodologies
- Include all carbon pools
- Recognition of 1991-2007 activities