Forest Industries Research Centre

Leading forestry innovation & applied research in Australia

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Overview of forestry research at USC

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- Three research centres

Tropical Forestry and People (TFAP-USC)

To help forest-dependent people to make better use of their forest resources to improve livelihoods and the environment

Timber Durability and Design Life Centre (TDDLC)

Advance Australian knowledge, design guides and standards as world leading in timber durability, enabling architects and builders to more easily choose the right timber for the right task in light of climate change, new engineered timbers and changes in building design.

Forest Industries Research Centre (FIRC-USC)

Leading industry engaged applied, whole of supply chain, research for commercially managed plantations & forests

FIRC-USC

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Aim:

Be a leading provider of applied, whole of supply chain, research for commercially managed plantations & forests

Focus:

Establish & grow collaborative research networks, nationally & internationally, with industry, government & research partners

Areas of Research:

- Forest resource improvement and establishment
- Forest and health management
- Harvest and haulage
- Supply/value chain management

The Metrics (2016)

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Members: **30**

Publications:**45**

Grants: **$2.65 million ($6.7 million)**

PhD Students: **9**

	Income			Students	
	year	signed	publication	Enrolled	Complete
2013	$723,471	$1,105,494	21	0.5	0
2014	$1,197,990	$6,828,734	21	2.5	0
2015	$3,010,879	$3,010,879	40	5.5	0
2016	$2,646,121	$6,670,581	45	8	0

Major Collaborations

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- Forest Operations Research Alliance (AFORA)

  Industry alliance guiding and funding research activities in forest operations, transport and logistics

- Biological Control of Eucalypt Pests (BiCEP)

  International partnership of eucalyptus growers developing commercial solutions to enhance biological control of insect pests

- Australian Forest Plantation Herbicide Consortium

  Applied research to extend the availability of chemicals for effective, sustainable and safe use for weed management in plantations

- Department of Agriculture & Fisheries Queensland Research partnership

  Advancing Queensland forest industries through applied tree improvement, plantation management and forest health research

Adapted operations for biomass recovery

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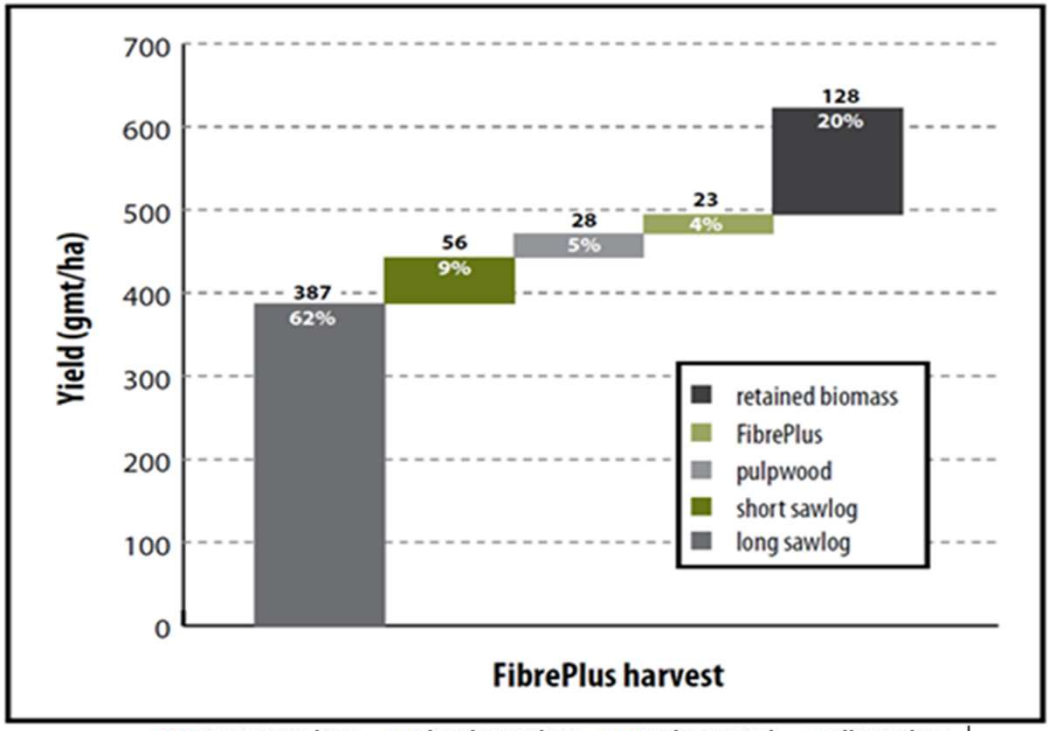

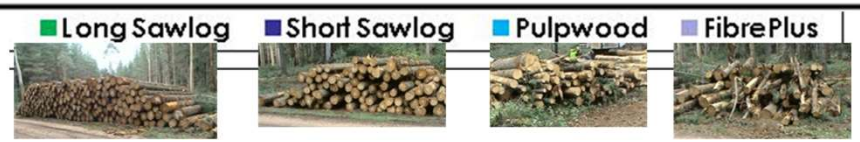

Fuel-adapted harvesting

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Residues are left in piles during fuel-adapted harvesting rather than being scattered as in conventional harvesting

Harvesting method	Residue Yield (tonnes/ha)*	Forwarder Productivity (tonnes/hour)*	% Residue retained*
Conventional	36	11.5	59
Fuel-adapted	48	15.8	25

37% productivity increase
33% yield increase

Field drying trials

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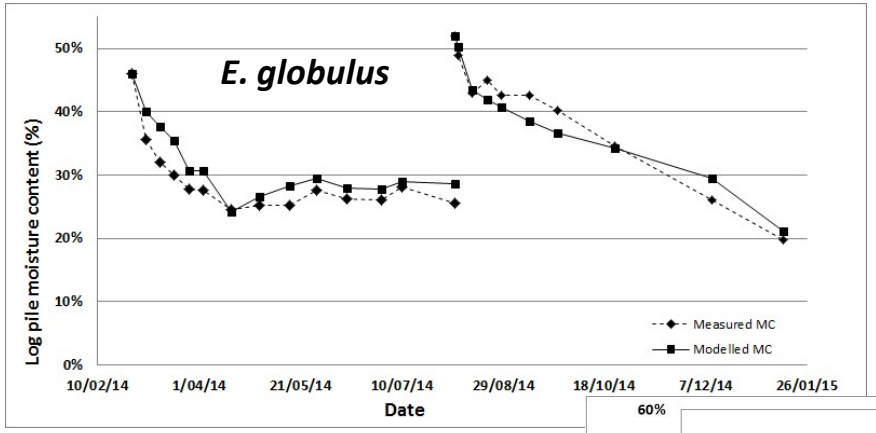
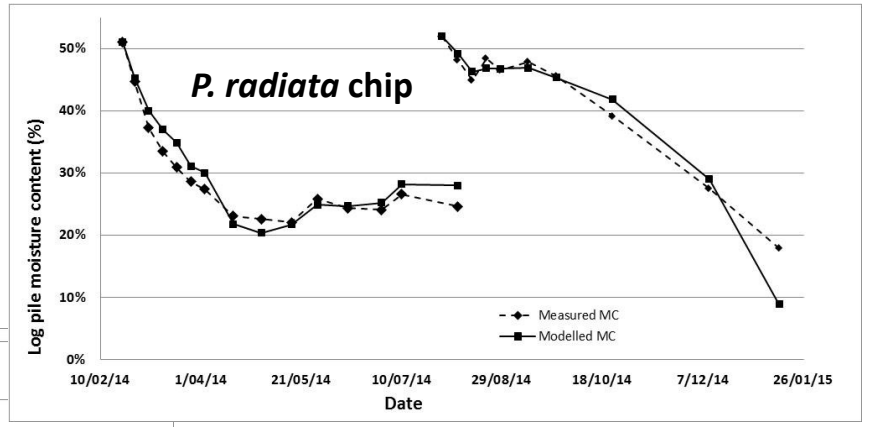
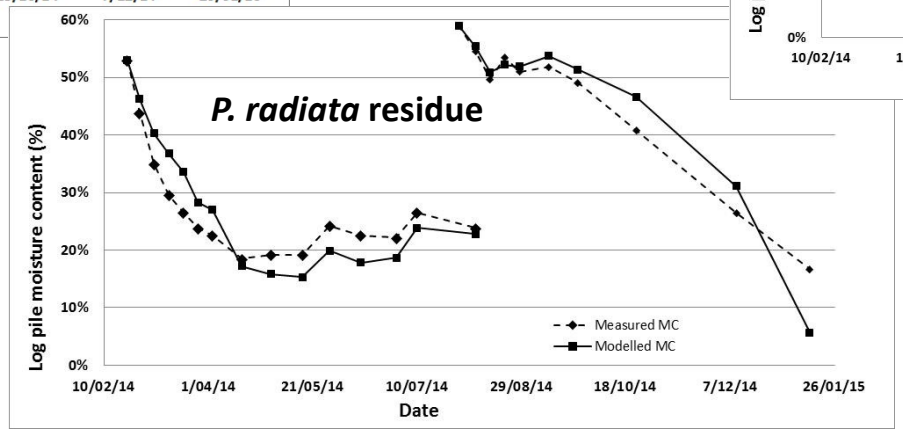
Variables used were Relative Humidity and net evapotranspiration







MCPLAN:
wood & biomass supply chain optimization

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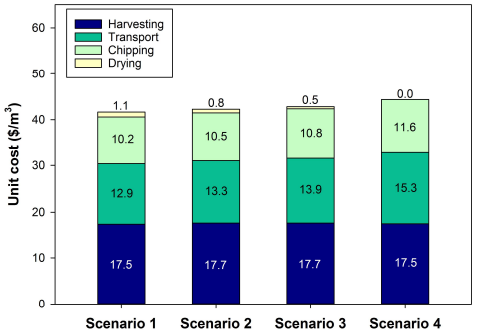
- The transport up to 50% of the delivered costs.
- MCPLAN optimises supply chains.
- MCPLAN impacts:
  - ~15% less truckloads,
  - Over 15% less fuel,
  - Upto \$2.5 / m^3 cost savings



Automated volumetric measurement

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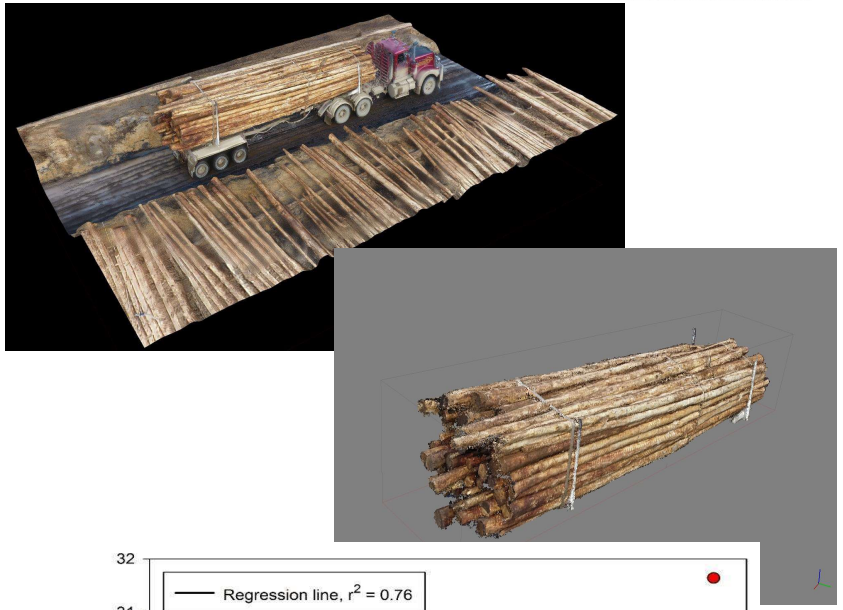
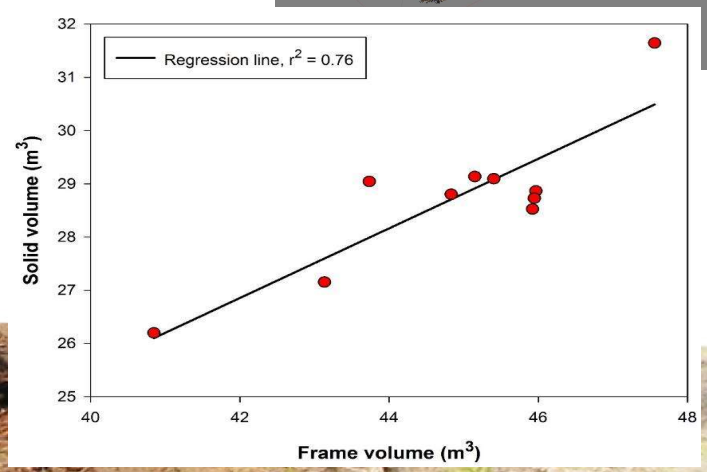
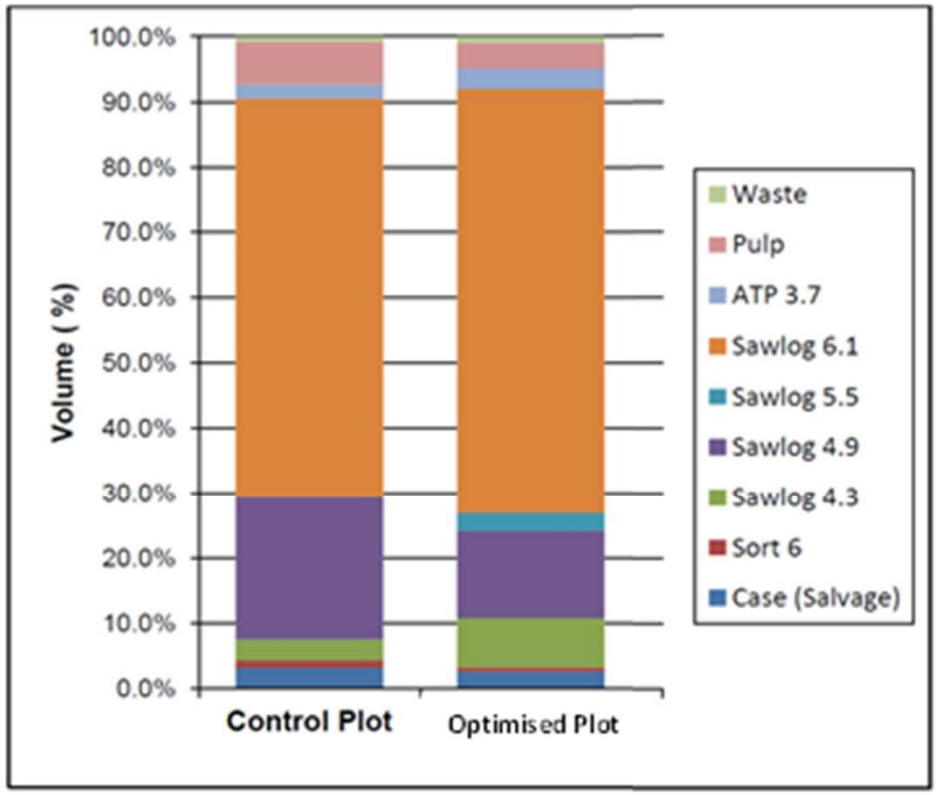
- Photogrammetry and 3D reconstruction is an inexpensive, effective, flexible, and user-friendly technique.
- Solid volume can be predicted from gross volume calculated with photogrammetric systems and 3D reconstruction software.
  - Predicted solid volume <2% error
- Exploring management & payment by volume.







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	Control Plot	Optimised Plot
Total Production (m^3)	216.3	218.6
Total Value ($)	$10,272.28	$10,598.37
Unit Value ($/m^3)	$47.48	$48.47

+2% more value

+7% productivity (less cost)

Future: areas of research interest

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- Adaptive forest supply chain management for dynamic markets
- Enhanced real time supply chain measurement for value driven decisions
- Integration of resource and operational data for improved value management
- Integrated land management for economic growth of industrial timber
- Resource and supply chains for advanced biorefinery and bioproducts
- Advanced automation and robotics in forest supply chains

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