

Presentation to:

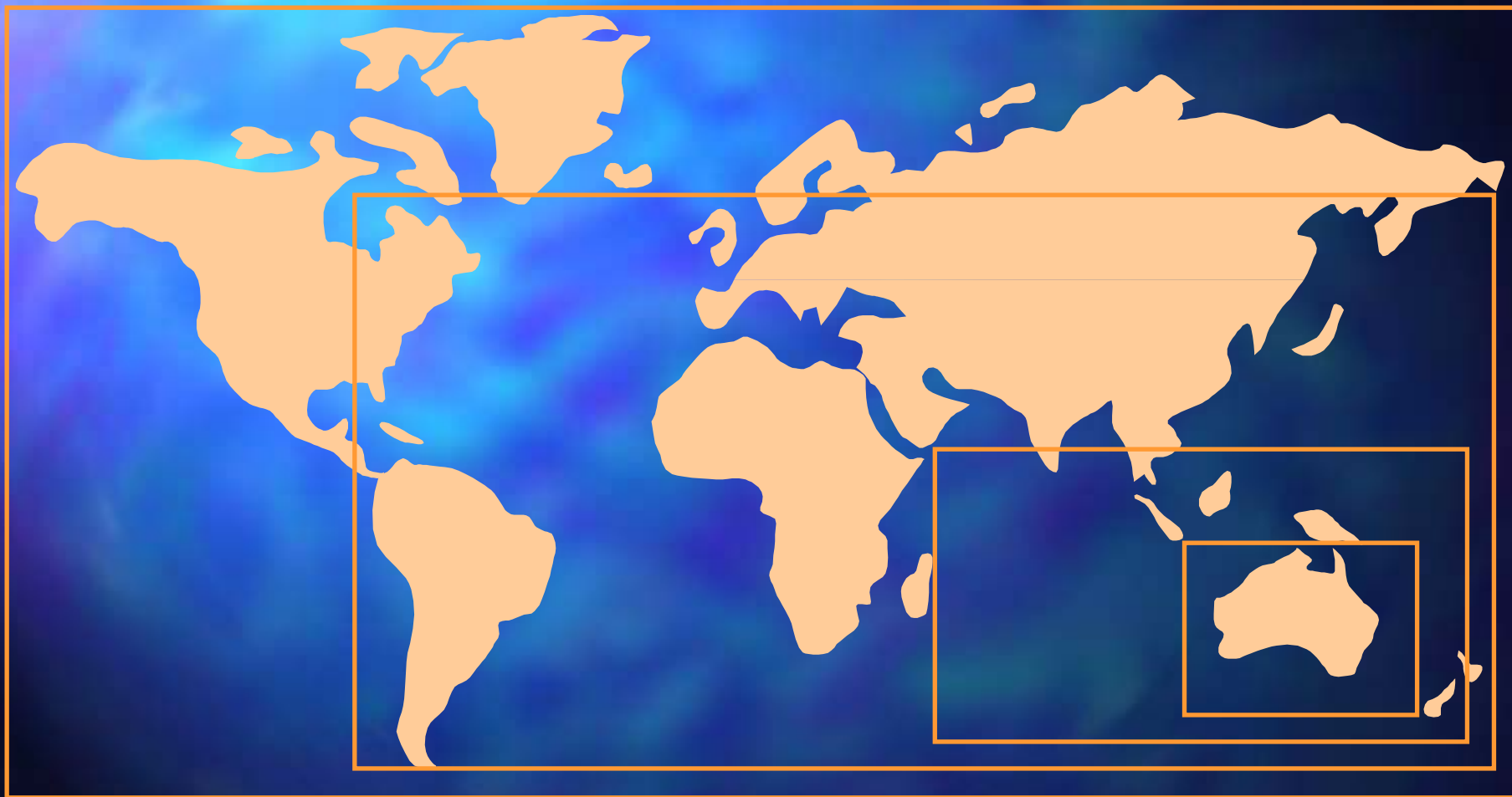
Oil Mallee Association

10 August 1998

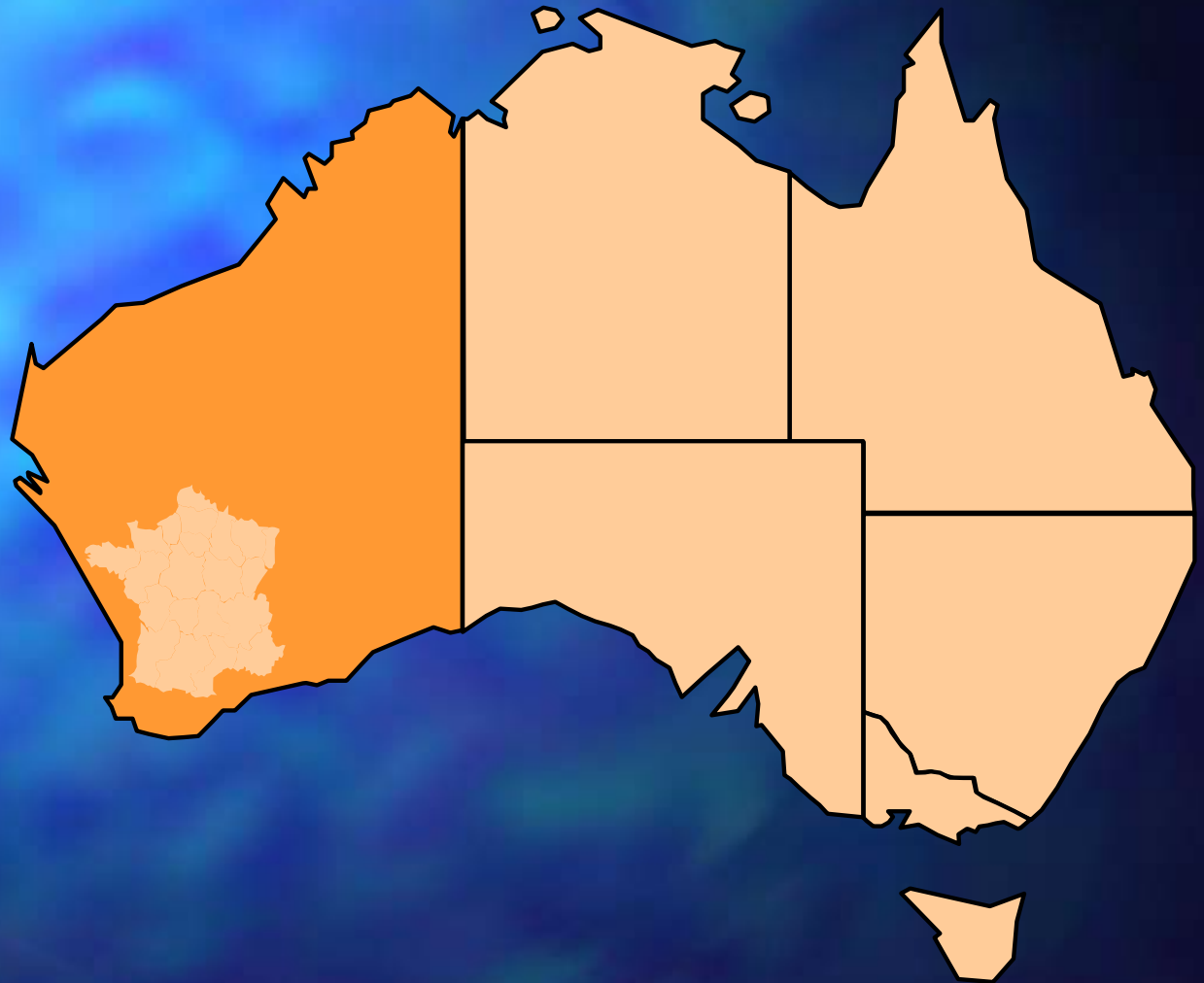
Dr Syd Shea

Executive Director

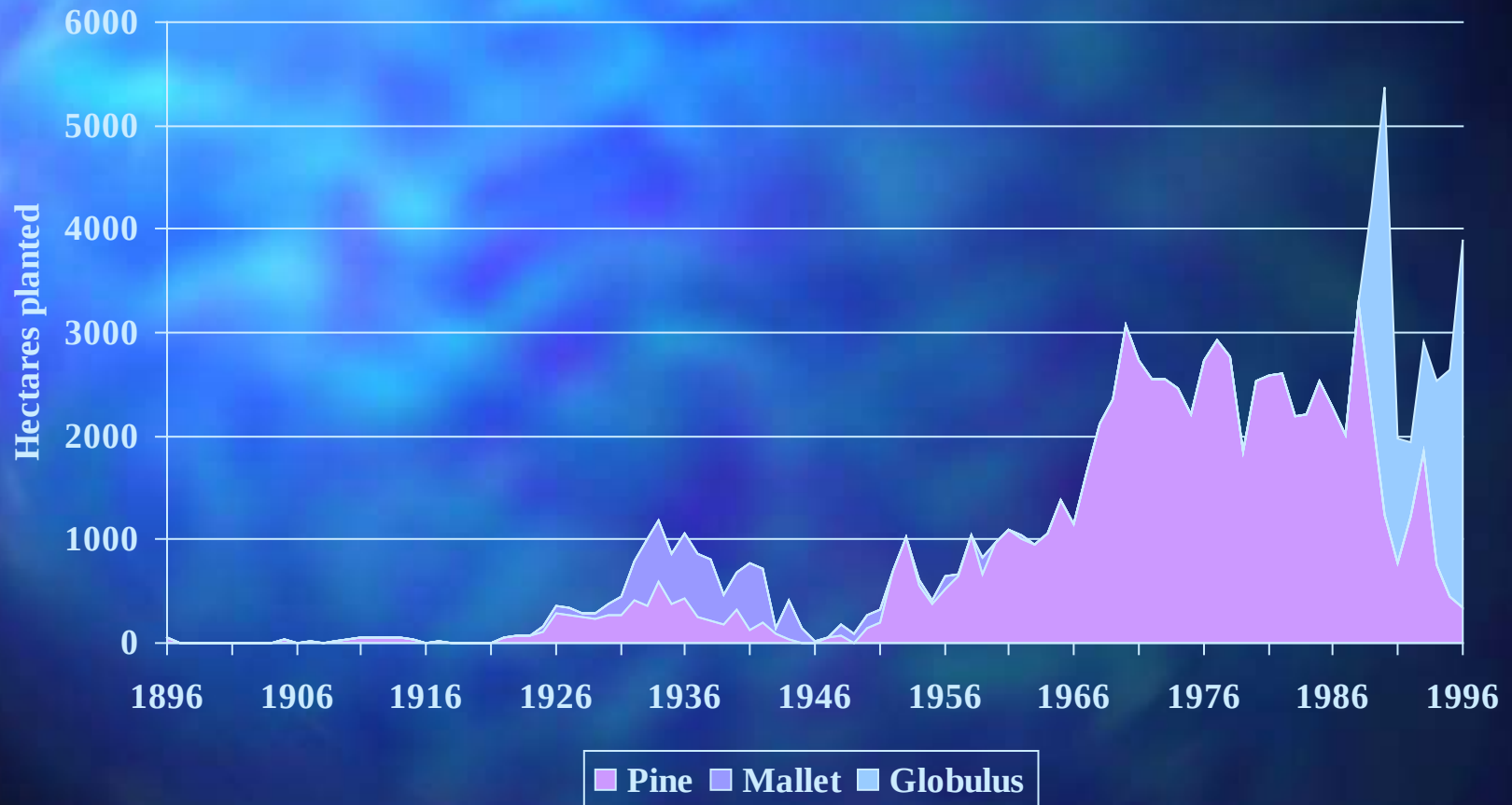
Department of Conservation and
Land Management, Western Australia

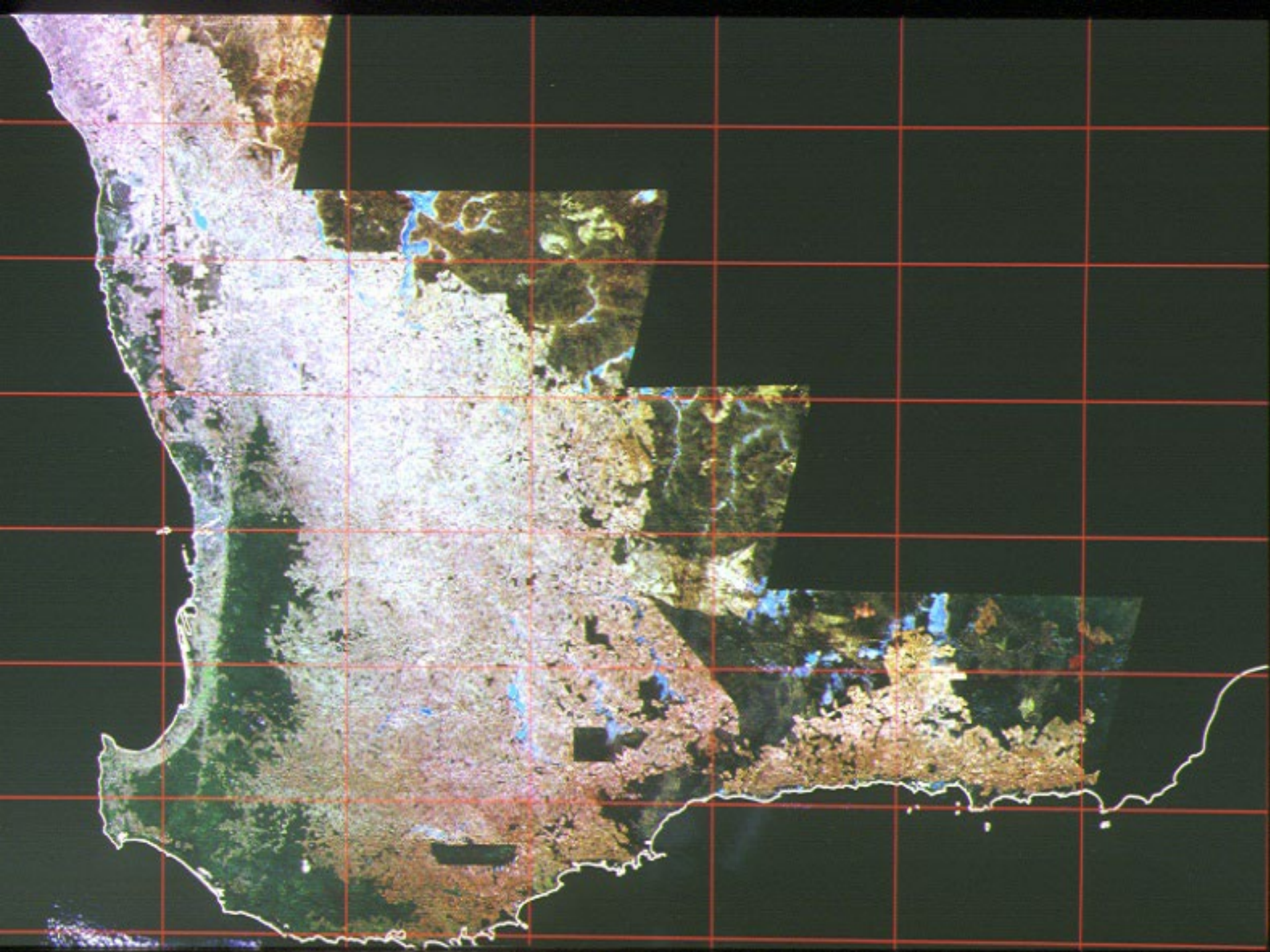


France
occupies a
land area
about a
quarter the
size of
Western
Australia



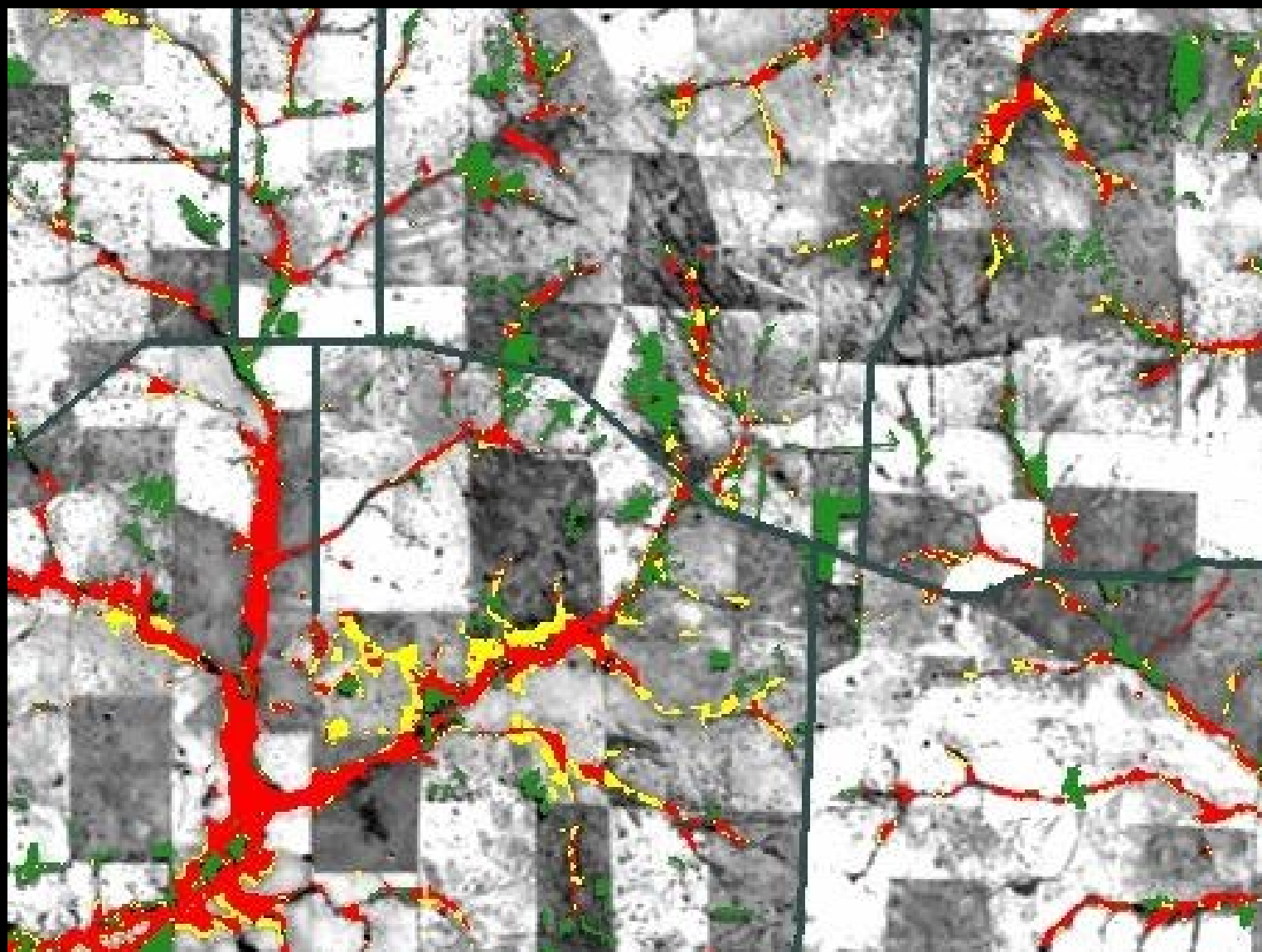
Tree plantings in Western Australia (WAFD/CALM)





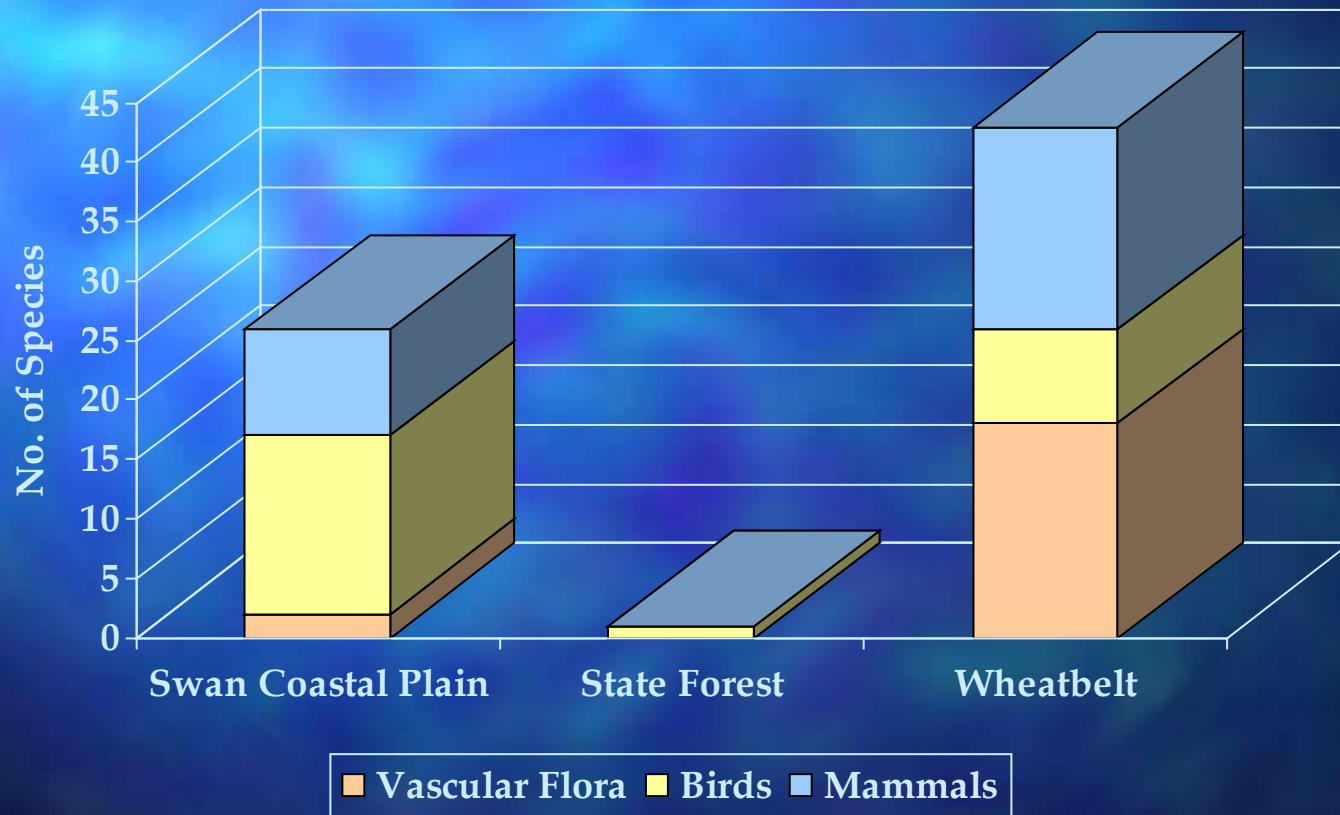






Species Extinctions Since European Settlement in 1829

(After Armstrong and Abbott, 1995)



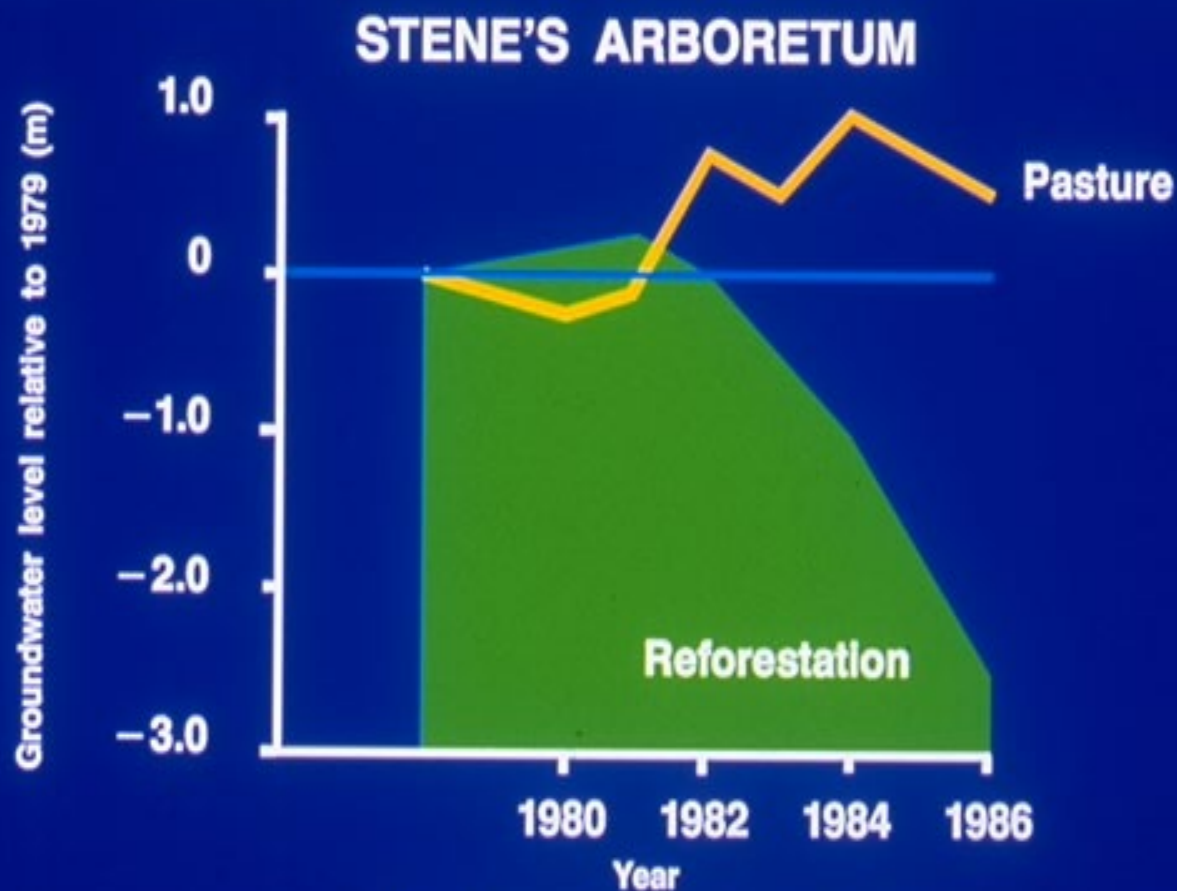






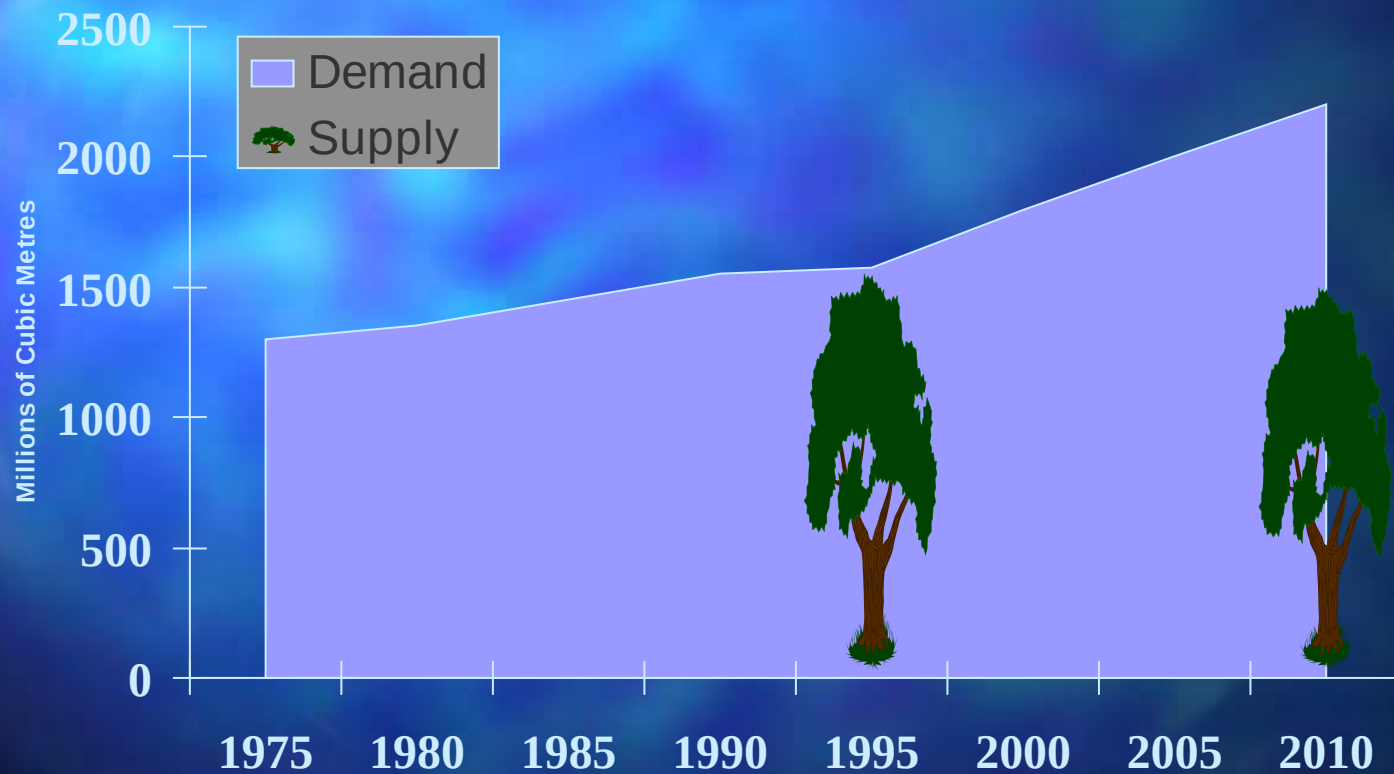


THE EFFECT OF TREE CROPS ON WATER TABLE LEVELS

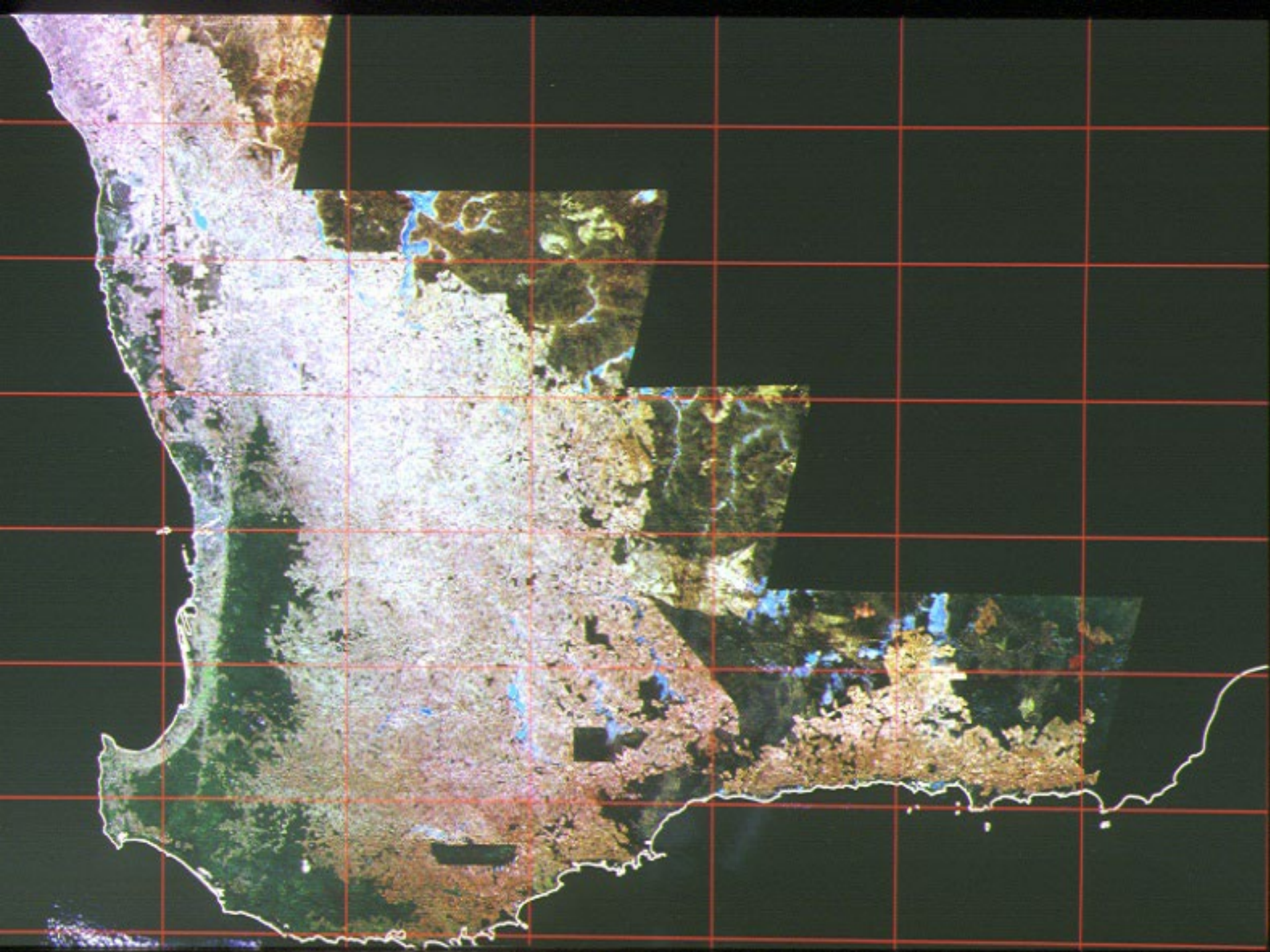


Water Authority of Western Australia
July 1989
Report No. WS 33

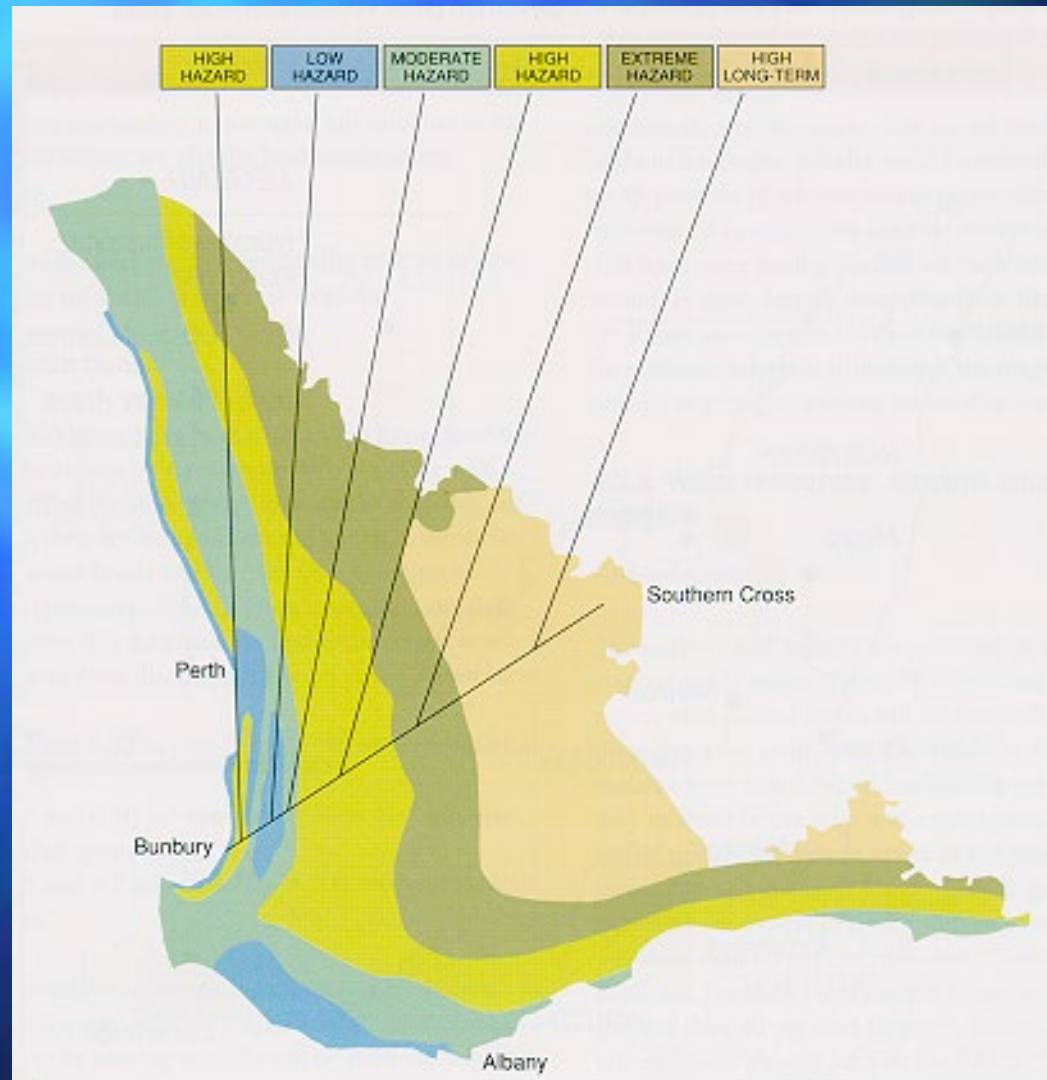
Global wood demand rises as supply falls







Salinity hazard zones in the South-West



Farm Forestry Zones by Area and Rainfall

	<i>Rainfall (mm)</i>	<i>Area ($\times 10^6$ ha)</i>		
		<i>Cleared land¹</i>	<i>Suitable land²</i>	<i>Plantable land³</i>
<i>Pine and Bluegum</i>	>600 mm	2	1.3	.26
<i>New Maritime Pine</i>	400-600 mm	6	4.0	0.8
<i>Wheatbelt</i>	<400 mm	10	6.7	1.3
<i>Total</i>		18	12.0	2.36



CALM SHAREFARMS

MARITIME PINE

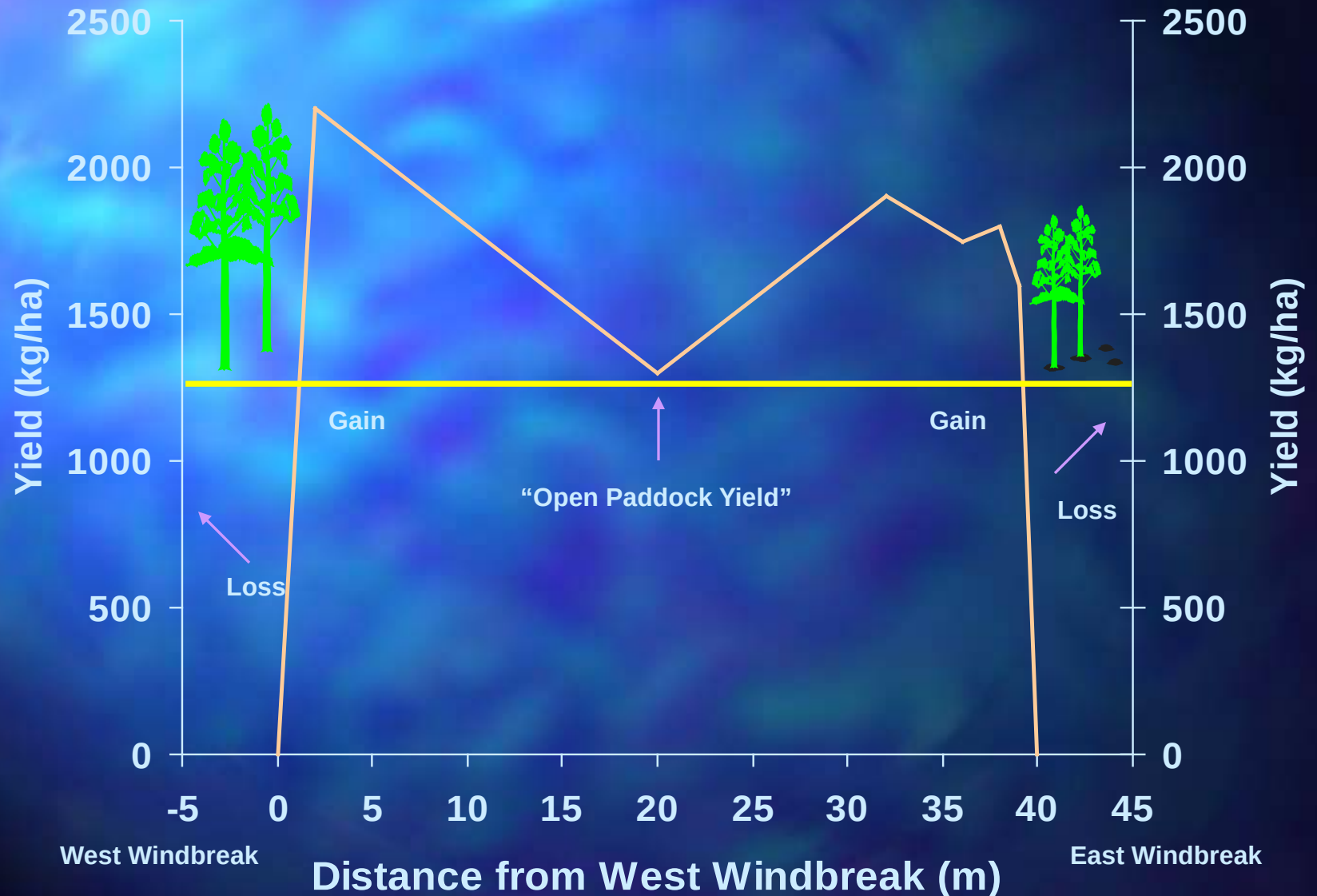
DORMAN PLANTATION PLANTED 1996



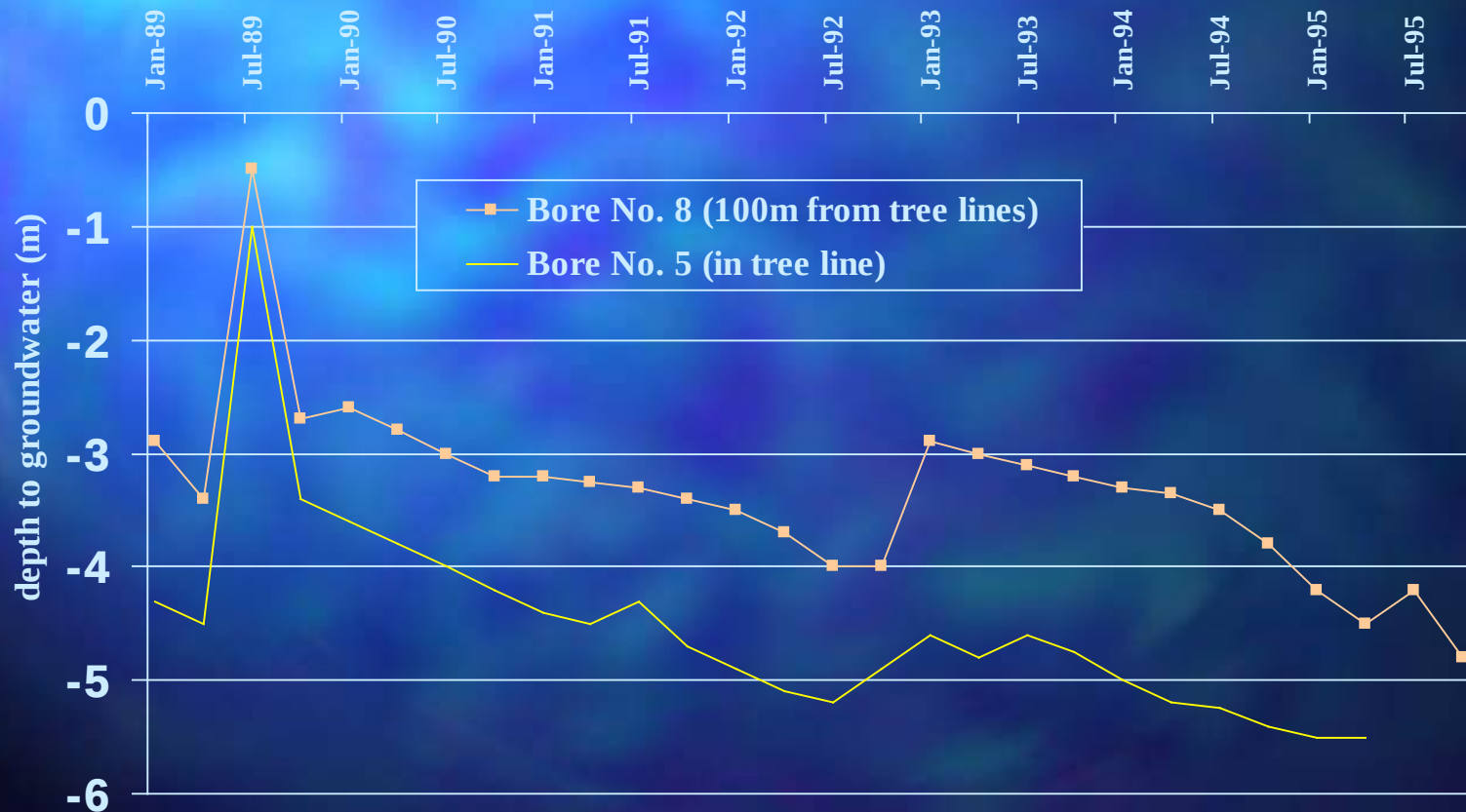




Lupin Grain Yield Between Parallel Pine Windbreaks at Esperance, Western Australia (Property of G & J English, 1988)



Hydrograph showing groundwater response to alley farming system



FORM P2
APPROVAL NO. B1629
WESTERN AUSTRALIA

TRANSFER OF LAND ACT 1893 AS AMENDED
PROFIT A PRENDRE

[Under s.34B Conservation and Land Management Act 1984 as amended]

DESCRIPTION OF LAND (Note 1)	EXTENT	VOLUME	FOLIO

ESTATE AND INTEREST (Note 2)

--

ENCUMBRANCES (Note 3)

--

OWNER (Registered Proprietor) (Note 4)

--

GRANTEE (Note 5)

EXECUTIVE DIRECTOR OF THE DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT a body corporate constituted by the Conservation and Land Management Act 1984 ("the Act") of Corner of Hackett Drive and Australia II Drive, Crawley Western Australia.

TERM OF PROFIT A PRENDRE (Note 6)

40 years, subject to earlier termination in accordance with clause 8, commencing on and including the First day of January 1998.

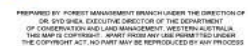
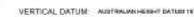
The Owner hereby Grants a Profit a Prendre to the Grantee for the term specified above over the land described above subject to the encumbrances shown hereon in accordance with the terms and conditions contained in this Deed.





Date:

1000 800 600 400 200 0 500 1000 metres



Categories	Area (ha)
P.97 TREE CROP AREA	372.5
TOTAL AREA	372.5

OR INTERNAL

HB - The surrounding location boundaries have been determined using 50 series mapping and are for schematic purposes only, there may be inconsistencies between the G.P.S. plot and the Cadastral data. If this is important for the intended use then the matter must be resolved by reference to INB.

DEPARTMENTAL PLAN FOR OPERATIONAL USE ONLY



CALM has joint ventures with 1303 farmers



CALM has contracts with 84 land management contractors







Inspect an *E. globulus* seedling for quality. Check the stem diameter, look for a pruned fibrous root system and notice if the foliage has a red tinge to show the seedling is hardy. All these aspects will help in the survival of the seedling. To be confident that the seedling will give you extra profit from its volume production in 10 years' time, look for the Western Blue Gum label.



Eucalyptus globulus

Breeding population trials

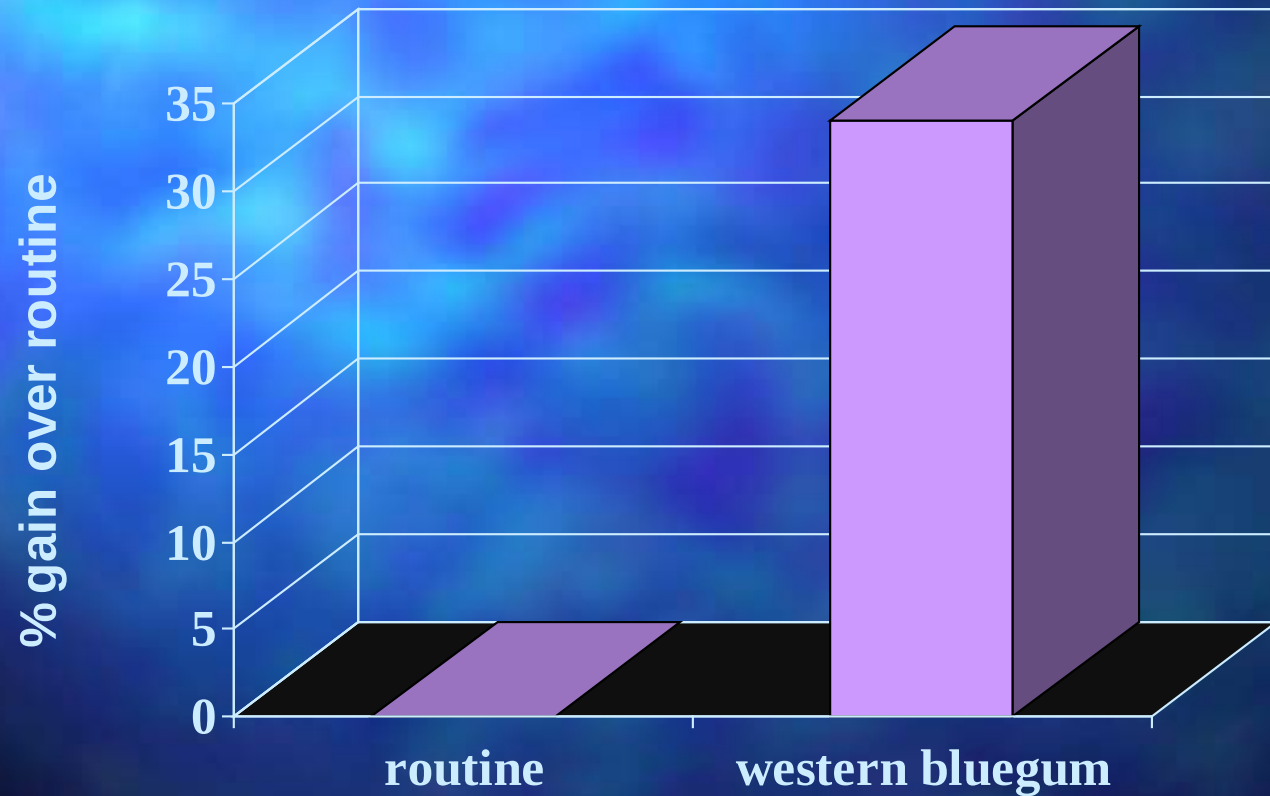
Program commenced in 1980

Source	Parents	Number	Area	Trees
CSIRO 1987 - 90	766	29	117 ha	107 000
King Island	83	1	3	3 000
Salt Tasmania	44	3	2	2 000
Orme	73	1	4	4 000
Orme (Prov)		2	11	6 000
APPM	73	4	4	3 000
CSIRO cc	135	1	3	3 000
Total	1174	41	144	128 000

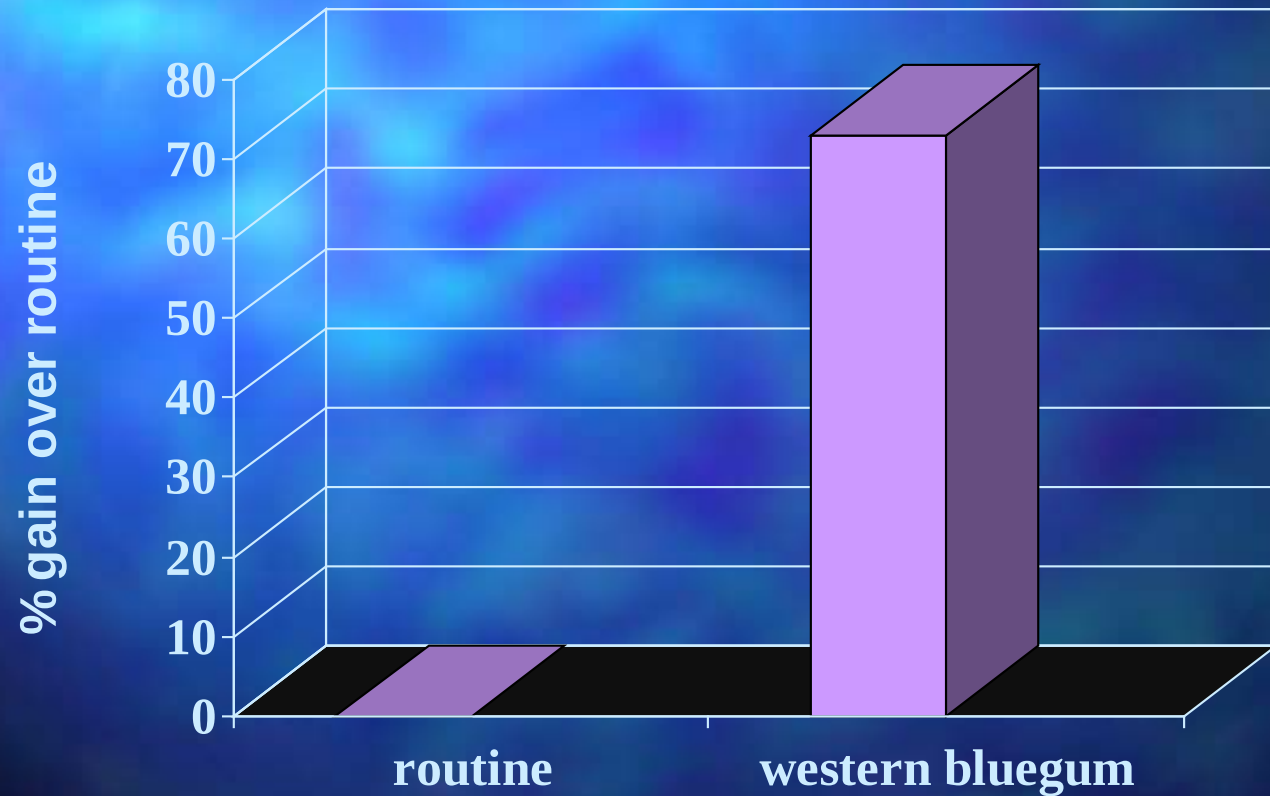
Traits assessed that influence breeding objective

- ❑ survival and health
- ❑ growth rate
- ❑ wood density
- ❑ tree form and branching
- ❑ drought tolerance
- ❑ salinity tolerance
- ❑ pest resistance
- ❑ flowering precocity and synchrony
- ❑ graft compatibility
- ❑ rooting ability

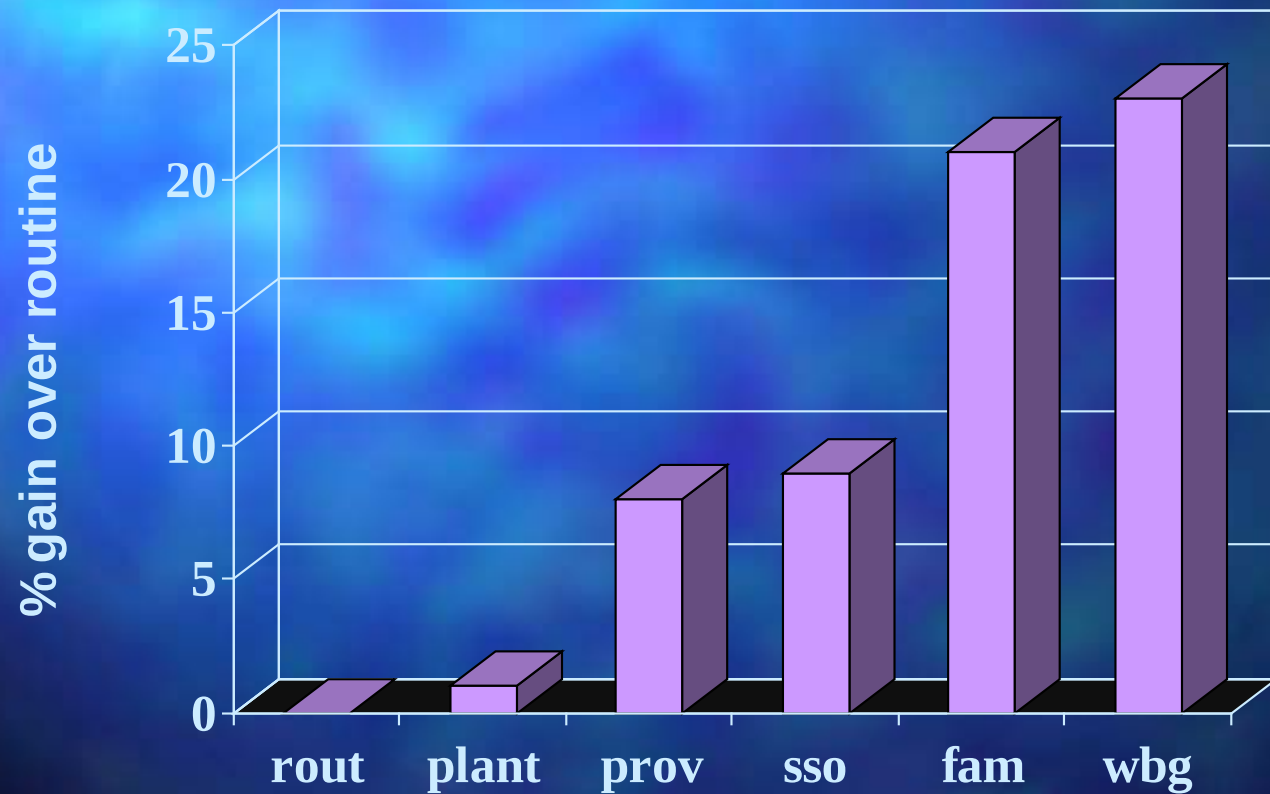
Genetic Gains Trial: **stem form**



Genetic Gains Trial: **crown**



Genetic Gains Trial: **wood volume**

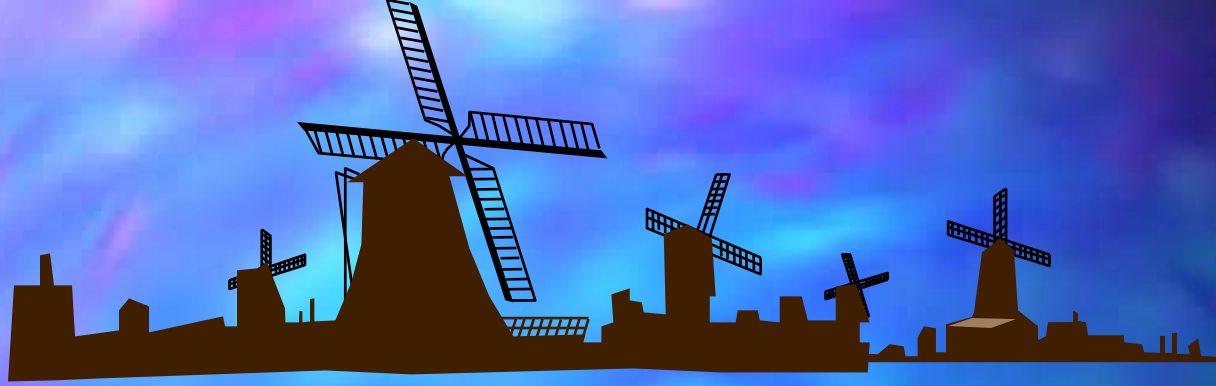


Western Bluegum

Tasmanian Bluegum

Trees are 2 years 8 months old





La Mancha

Maritime Pine





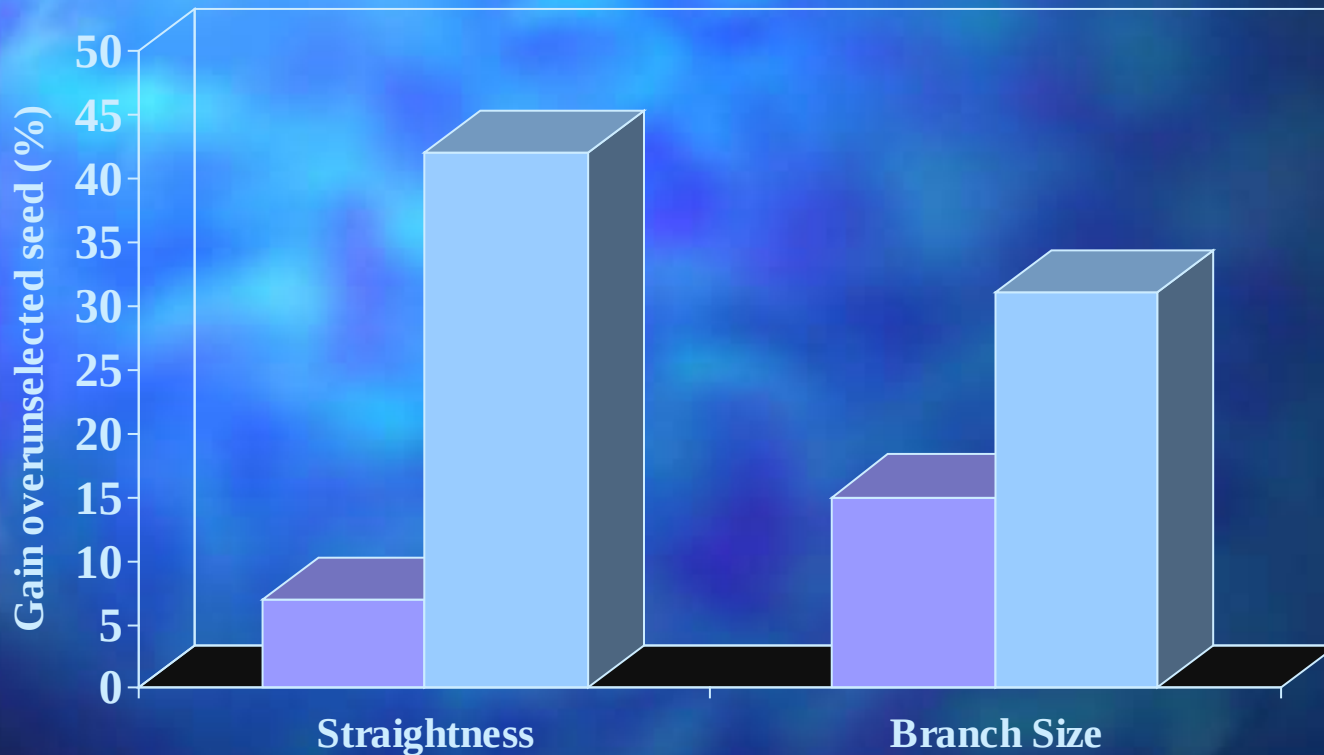
CALM's Genetic Resource:

Pinus pinaster

Program commenced in 1957

	Parents	Number	Area	Trees
Breeding Population Trials	313	93	171 ha	202 000
Breeding Research Trials		11	43 ha	45 000
Clonal Seed Orchards		4	48 ha	(24 ha active)
Clonal Archives		3	6 ha	

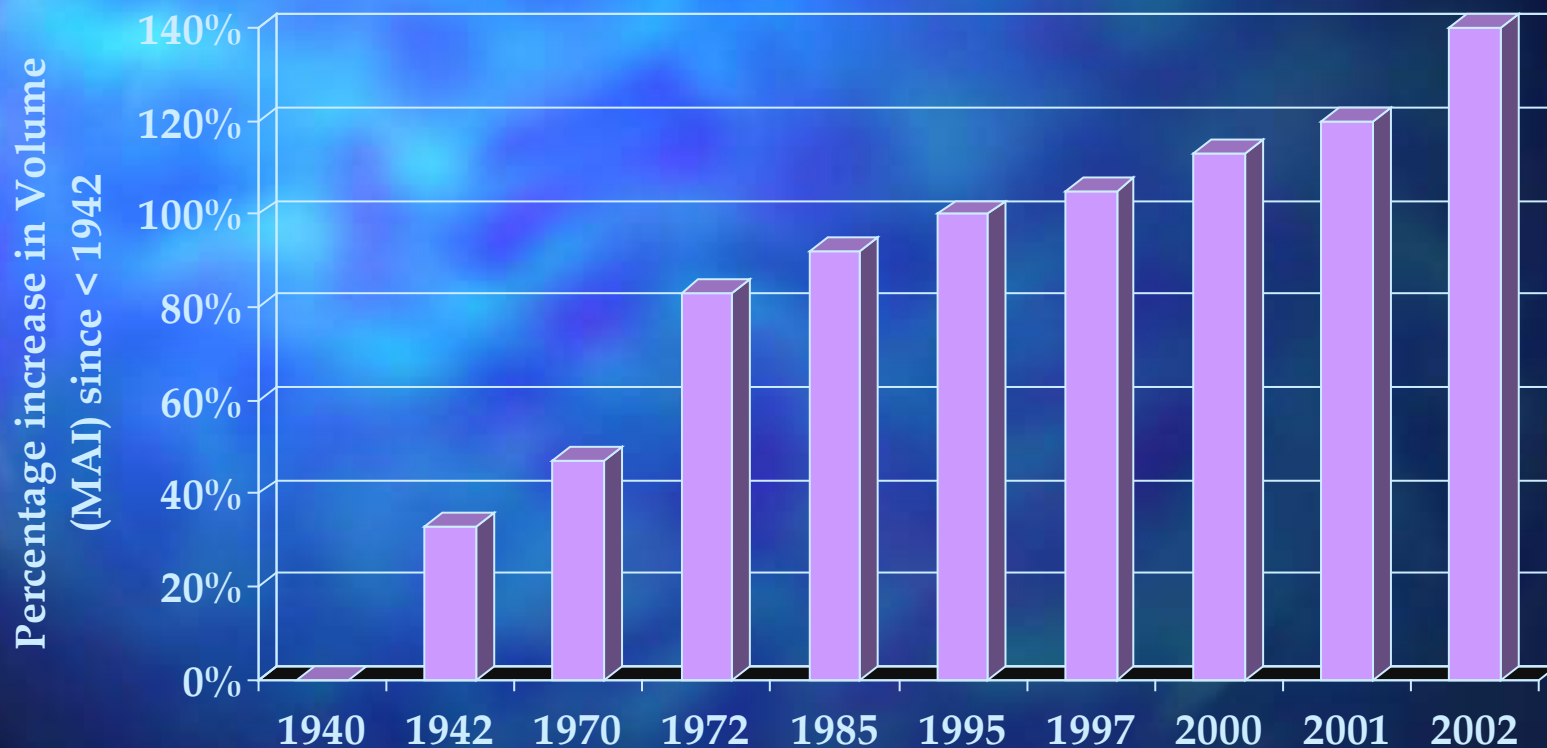
Maritime Pine Breeding Improvement



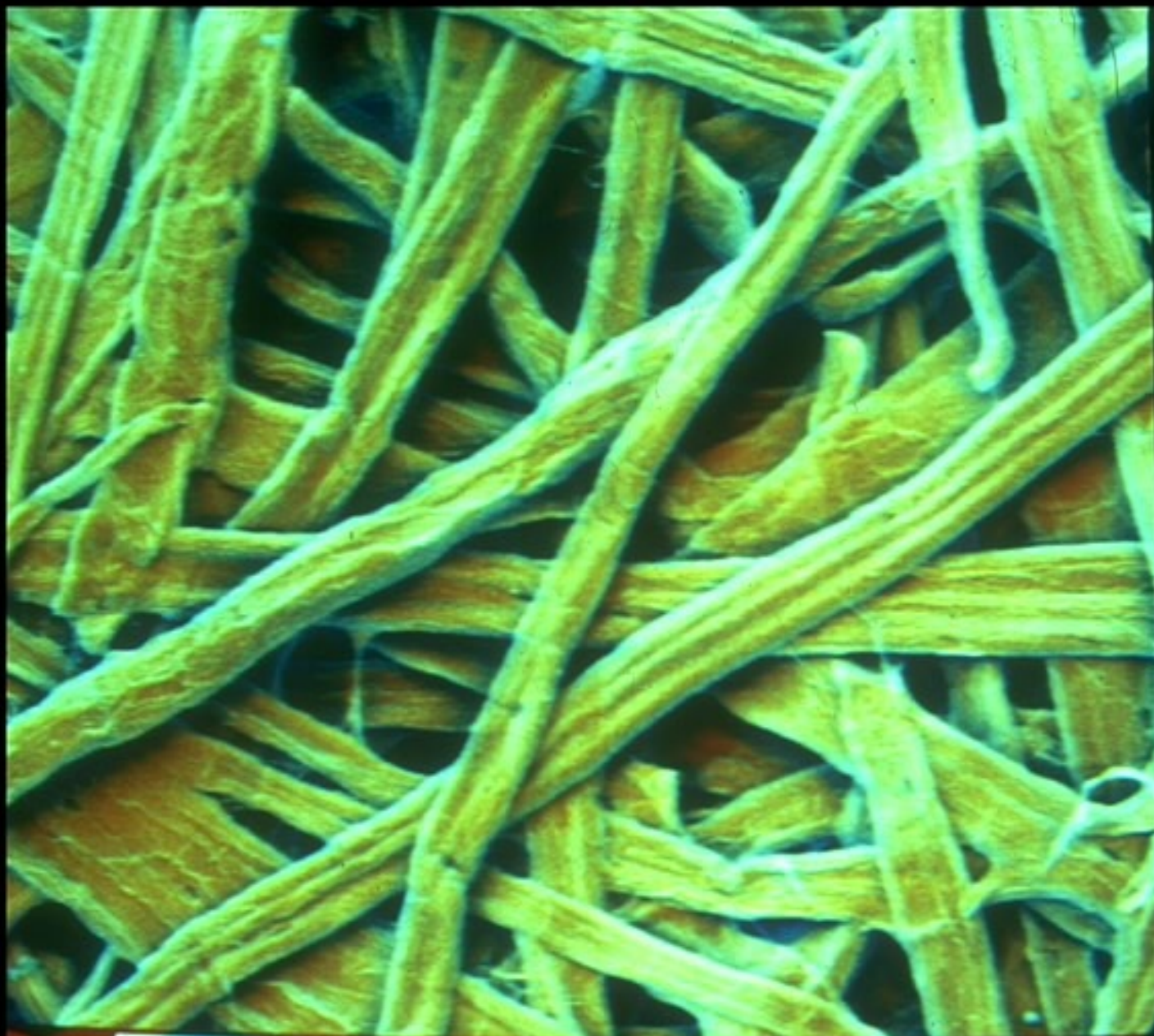
■ Plantation Grown From Unselected Seed ■ Stand Grown From Selected Seed



Volume gains from the tree improvement program for Maritime pine







40PM

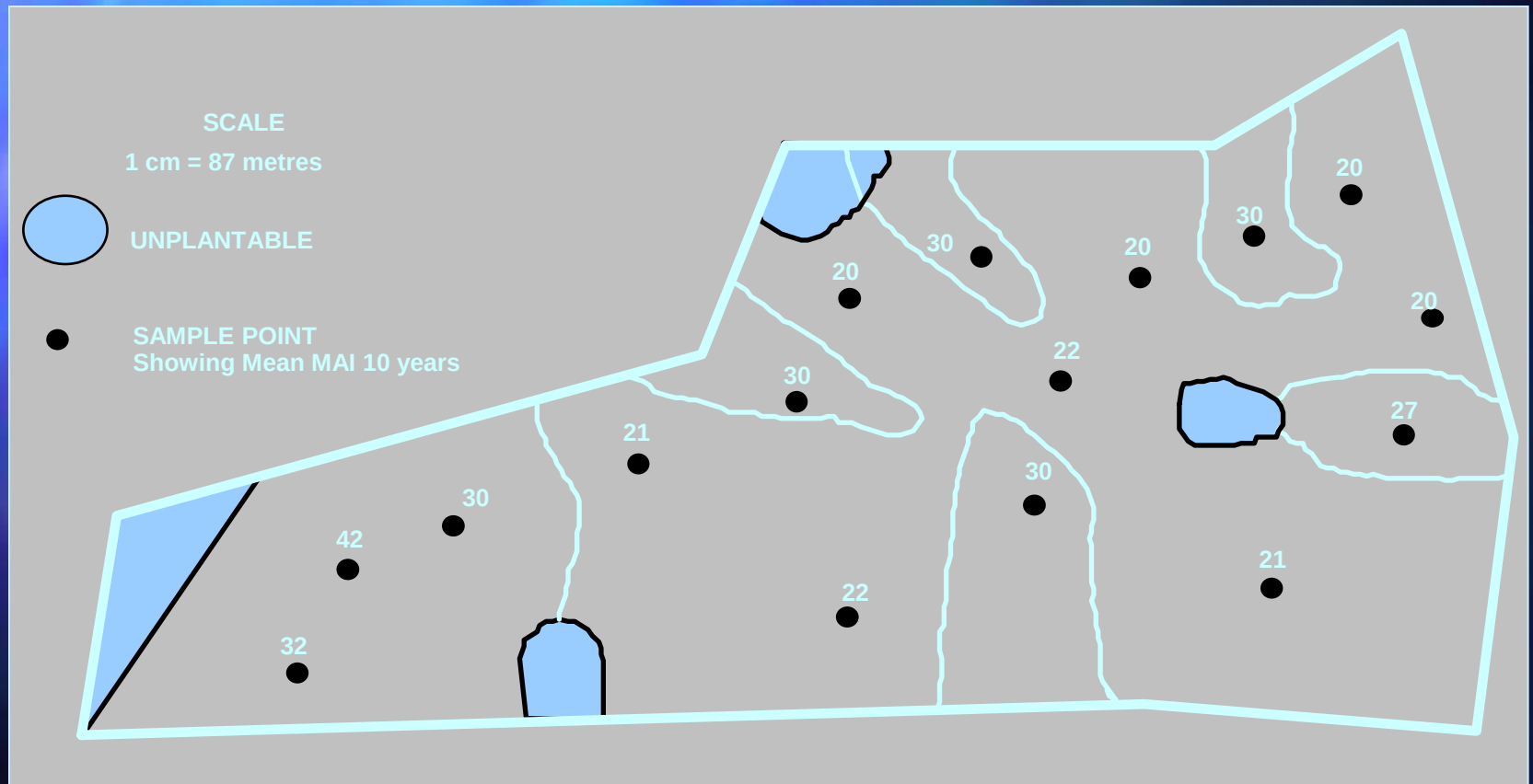
15KV

02

006

2

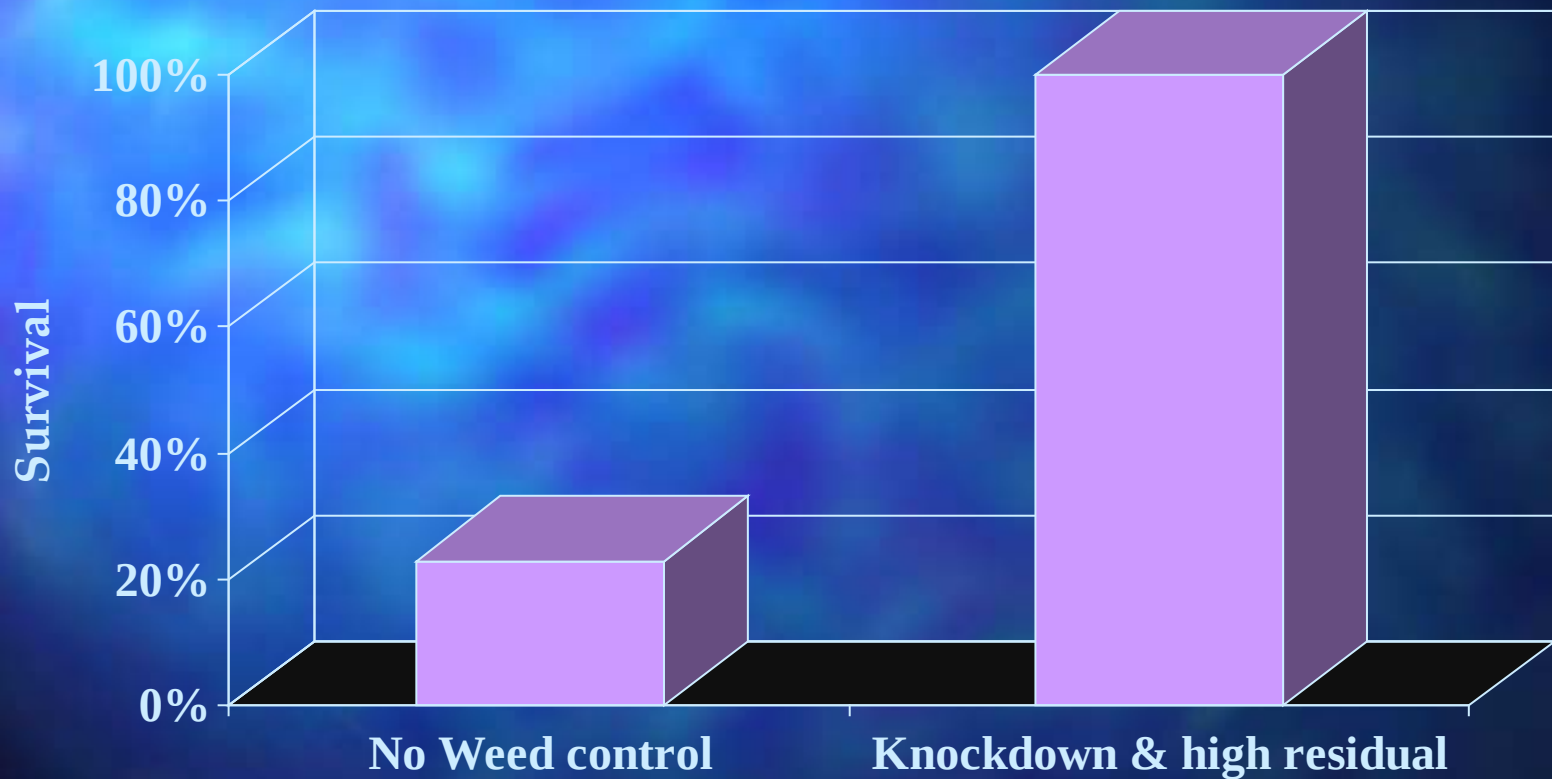
E. globulus site productivity assessment for a typical farm







Effect of chemical weed control on *Tree Crops*





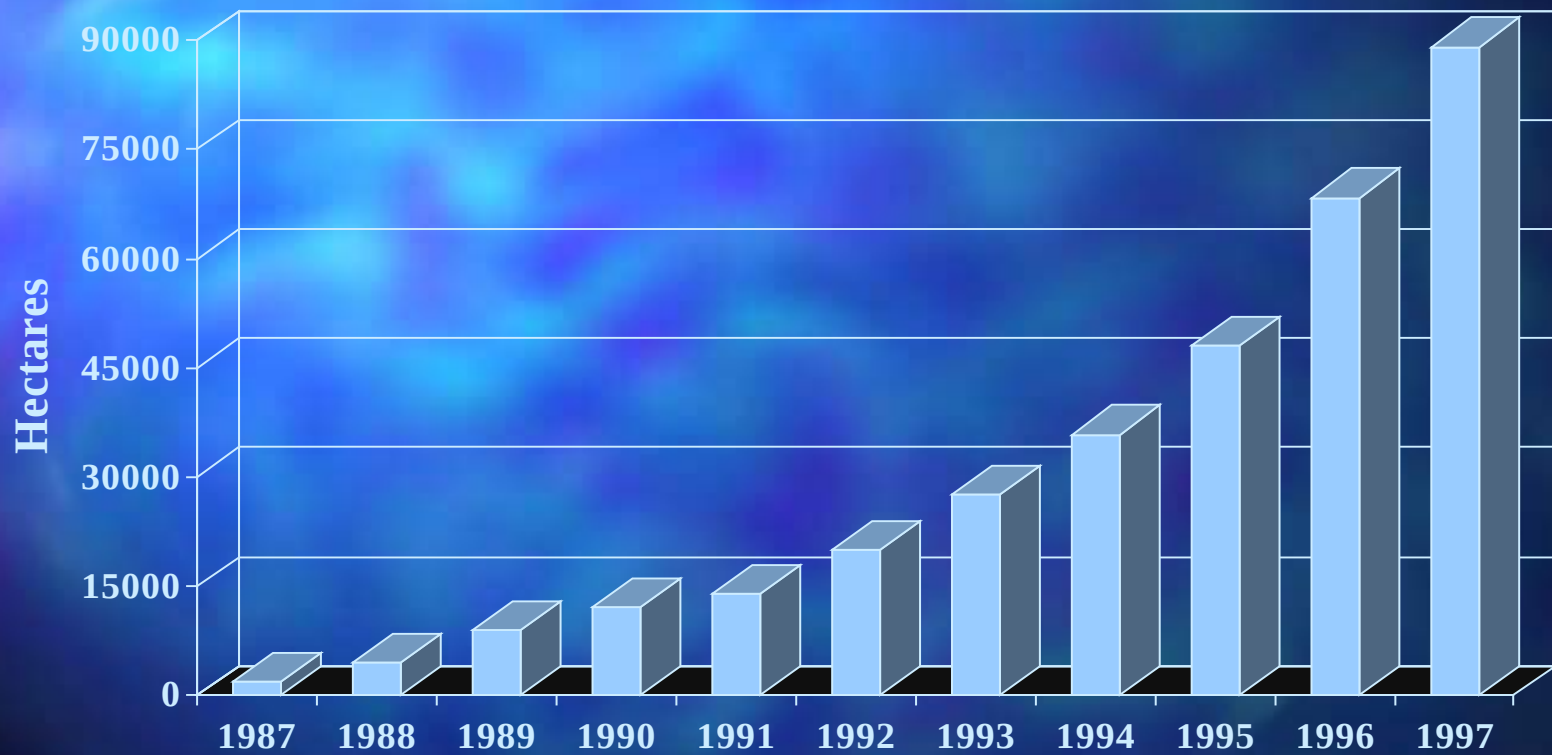




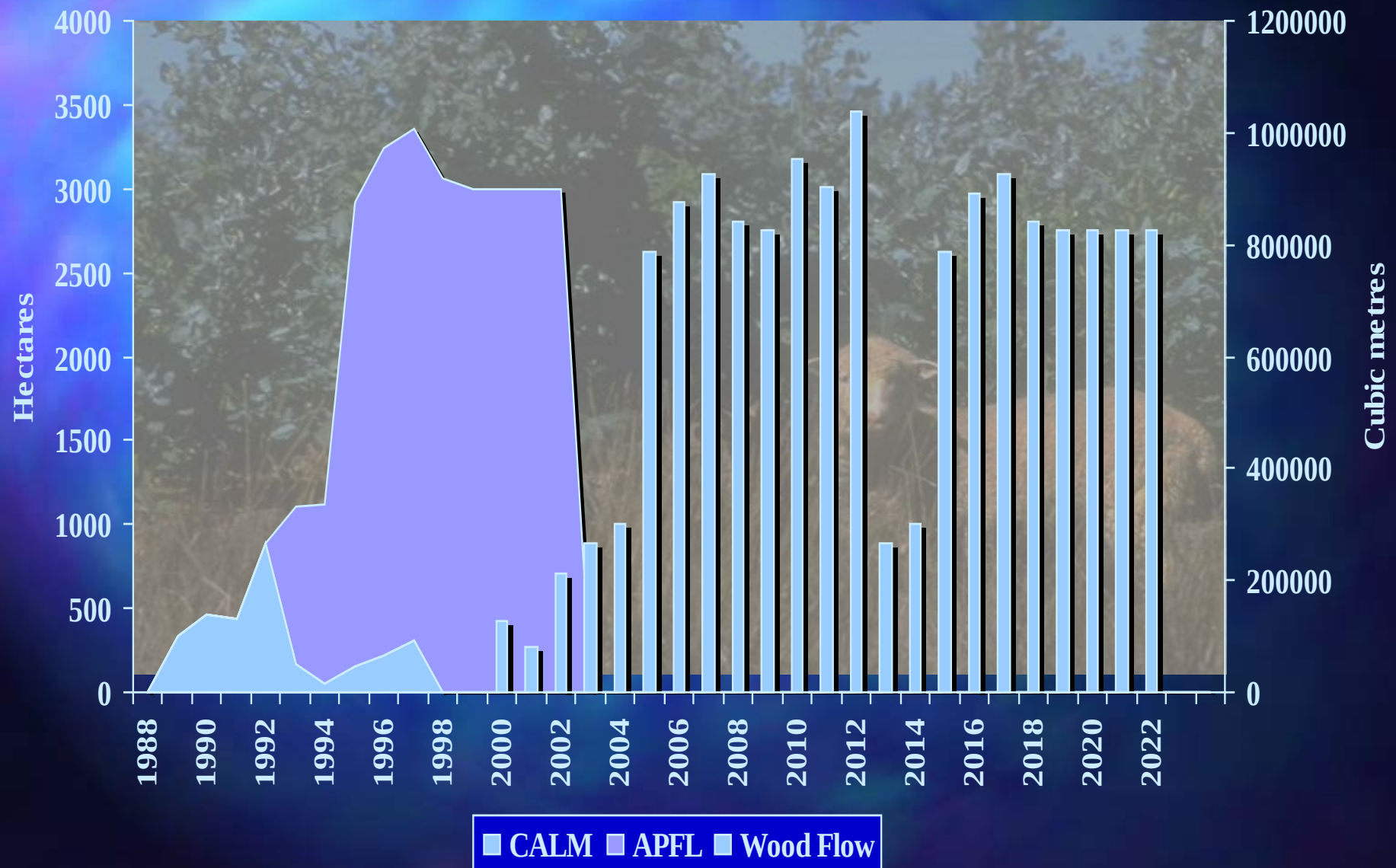




Total area of *E. globulus* in WA



Area of bluegums planted each year (CALM and APFL) and predicted wood flows



Investment to
date:

- ▣ \$20 million

Investment to complete plantation program:

\$30 million

Investment required for harvesting, transport and
processing:

\$20 million to upgrade facilities at Albany Port

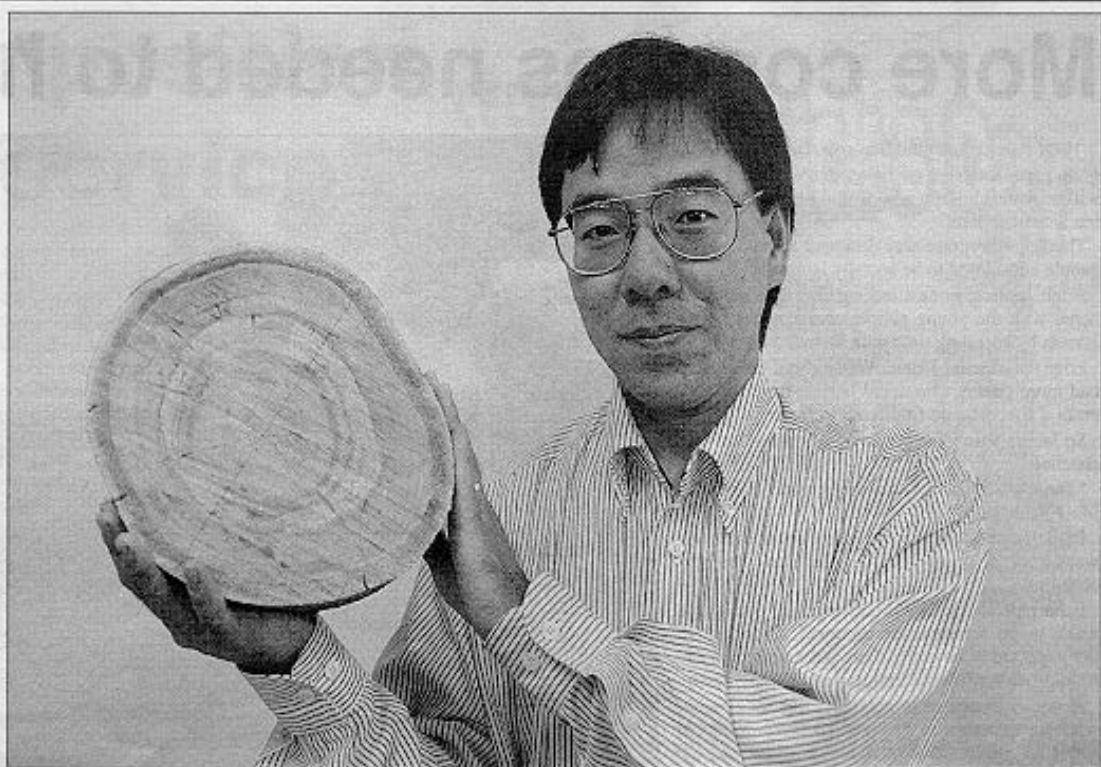
\$15 million for a mill to process the harvested logs

\$3-4 million for a transport system

\$16 million for harvesters

\$12 million for loading machinery

\$22 million for log trucks



WINNING WAYS: Albany Plantation Forest Company director Tom Okada plans to accept the Asia Pacific Marketing Federation's inaugural gold environmental marketing award in Bangkok later this month.

Conservation work wins praise

AN Albany company has won an international award for its services to the environment.

Albany Plantation Forest Company this week took out the Asia Pacific Marketing Federation's award inaugural gold marketing award, launched last year to encourage environmental conservation.

It was chosen from four finalists, from companies working in the 15 countries represented in the Asia Pacific Marketing Federation.

The company was formed in 1993 and plans to establish more than 20,000 hectares of bluegum

plantations in the Albany region.

Working with CALM, it had already planted nearly 14 million trees locally.

Its parent companies Oij Paper and Itochu Corporation are part of a WA-Japanese joint venture (with Bunnings Forest Products) who are planning a \$30 million woodchipping mill in the Great Southern. The project has been tipped to be operational by next year.

Director Tom Okada said the company was committed to preserving the global environment.

"Our project to establish commercial bluegum plantation is a long-term commitment to the environment and

economy of the Albany region," he said.

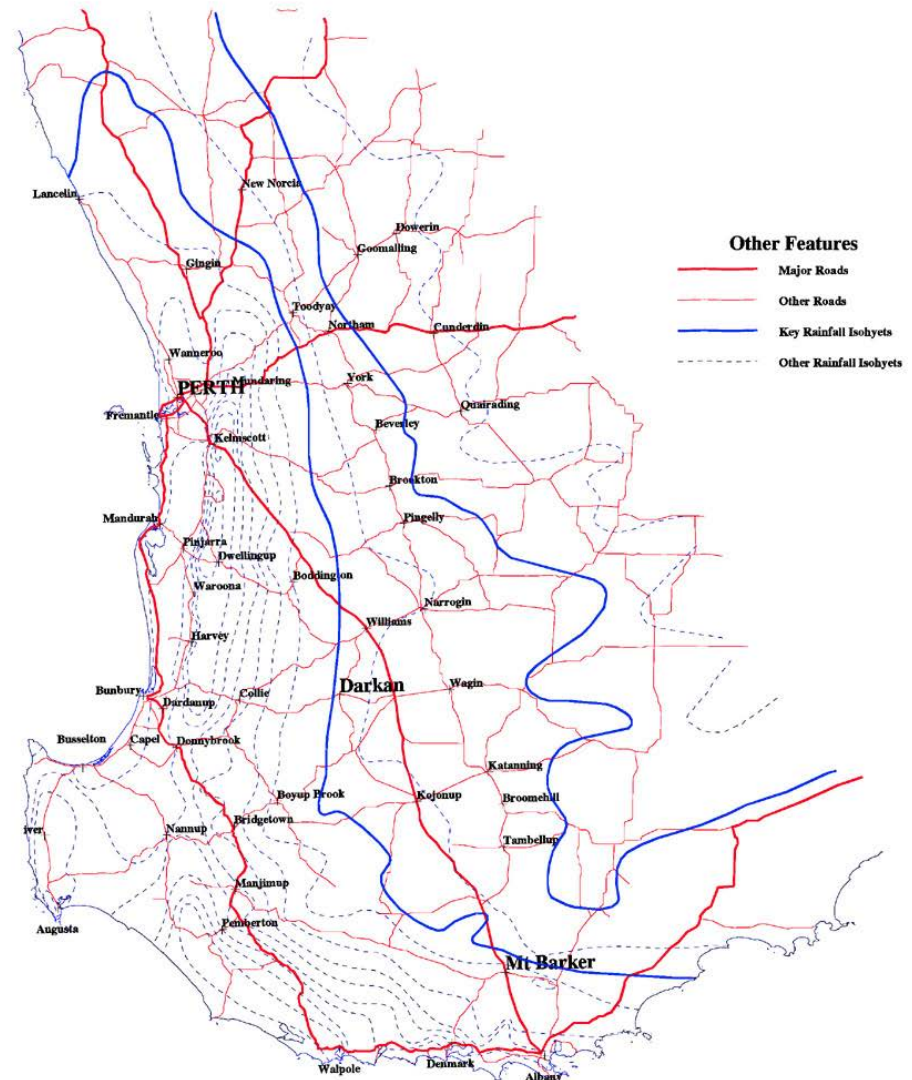
"Our sophisticated sharefarming scheme, which is being carried out in partnership with the local community, has now brought APFC international recognition."

Mr Okada will accept the award, with representatives Oij Paper, Itochu Corporation and Senshukai Co Ltd, at a ceremony in Bangkok on March 26 by her Royal Highness Princess Maha Chakri Sirindhorn. It is the second environmental award won by the company. In 1995 it won the Landcare Australia award for WA business.



Rainfall Isohyets for South West of Western Australia

Average Annual Rainfall Highlighting the 400 and 600 millimetre Isohyets



Scale 1:2500000

Projection: UTM(Zone50)

Date: 13/05/1998

Conservation and Land Management

IMB/GISS Job No.98042104-xx3

Data Sources Used

TENURE - Department of Land Administration

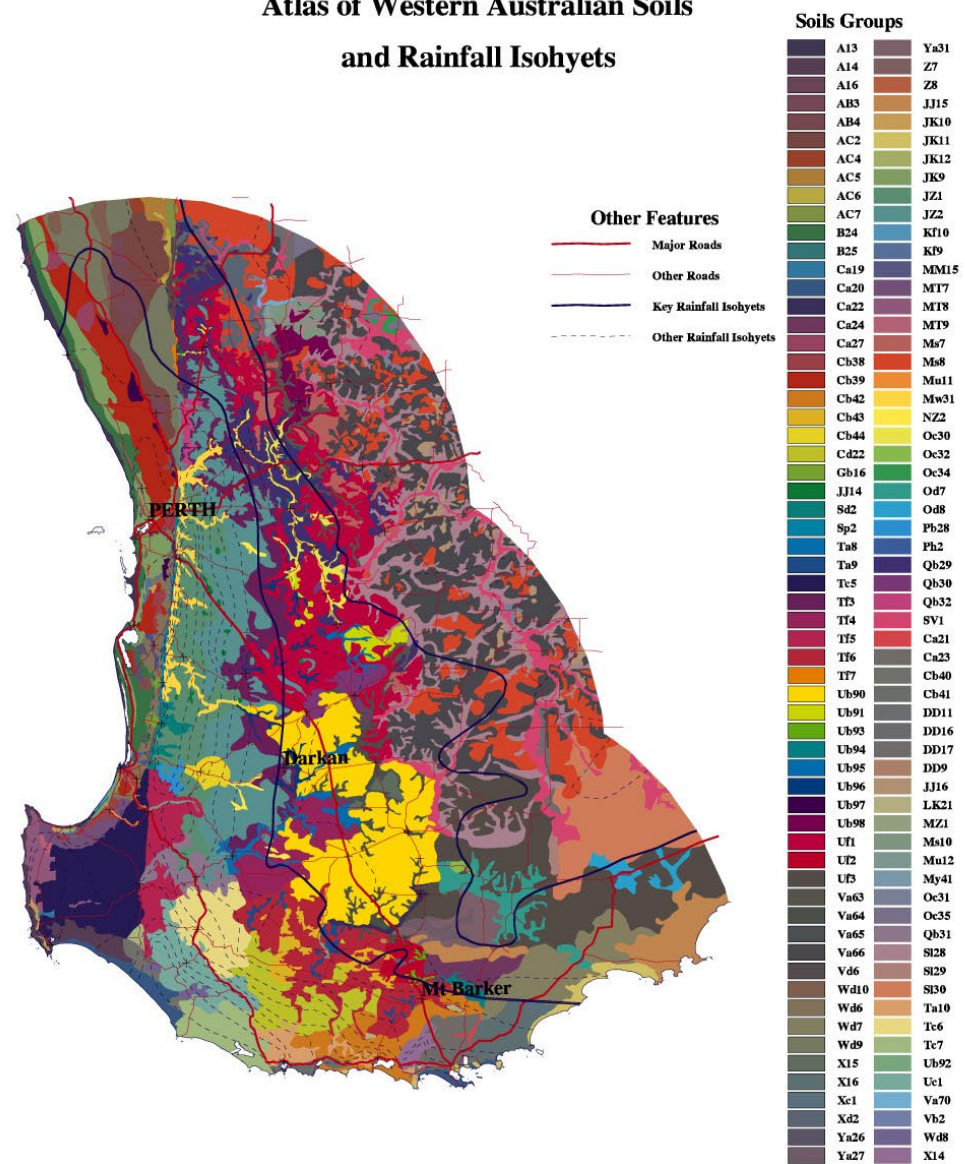
VEGETATION - Conservation and Land Management

SOILS - Agriculture, Western Australia

RAINFALL - Ministry for Planning

Atlas of Western Australian Soils

Atlas of Western Australian Soils and Rainfall Isohyets



Scale 1:3000000

Projection: UTM(Zone50)

Date: 07/05/1998

Conservation and Land Management

IMB/GISS Job No.98042104-xx2

Data Sources Used

TENURE - Department of Land Administration

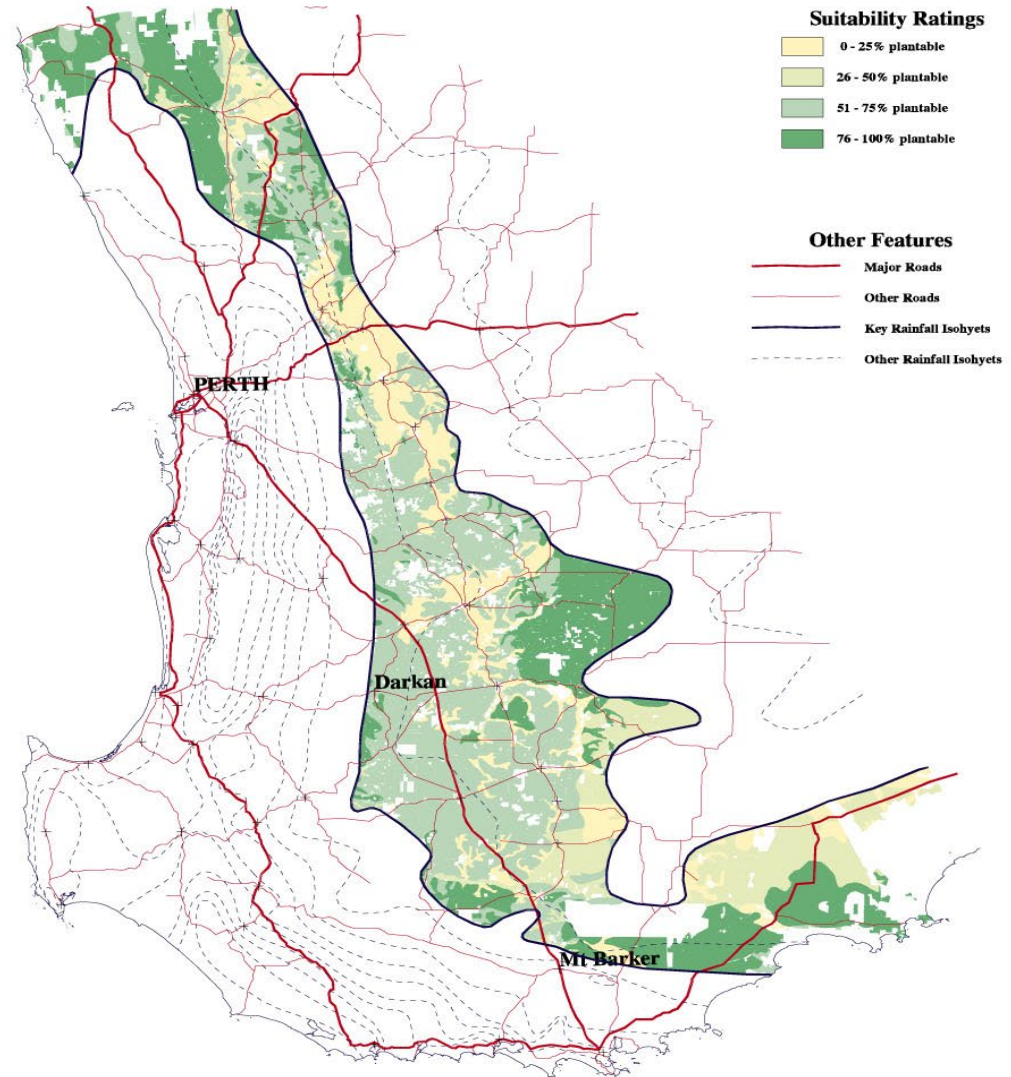
VEGETATION - Conservation and Land Management

SOILS - Agriculture, Western Australia

RAINFALL - Ministry for Planning

Land Suitability Study for Maritime Pine

Land Suitability Study for Maritime Pine
with an average annual rainfall between 400 and 600 millimetres



Scale 1:2500000

Projection: UTM(Zone50)

Date: 07/05/1998

Conservation and Land Management

IMB/GISS Job No.98042104-xx1

Data Sources Used

TENURE - Department of Land Administration
VEGETATION - Conservation and Land Management
SOILS - Agriculture, Western Australia
RAINFALL - Ministry for Planning











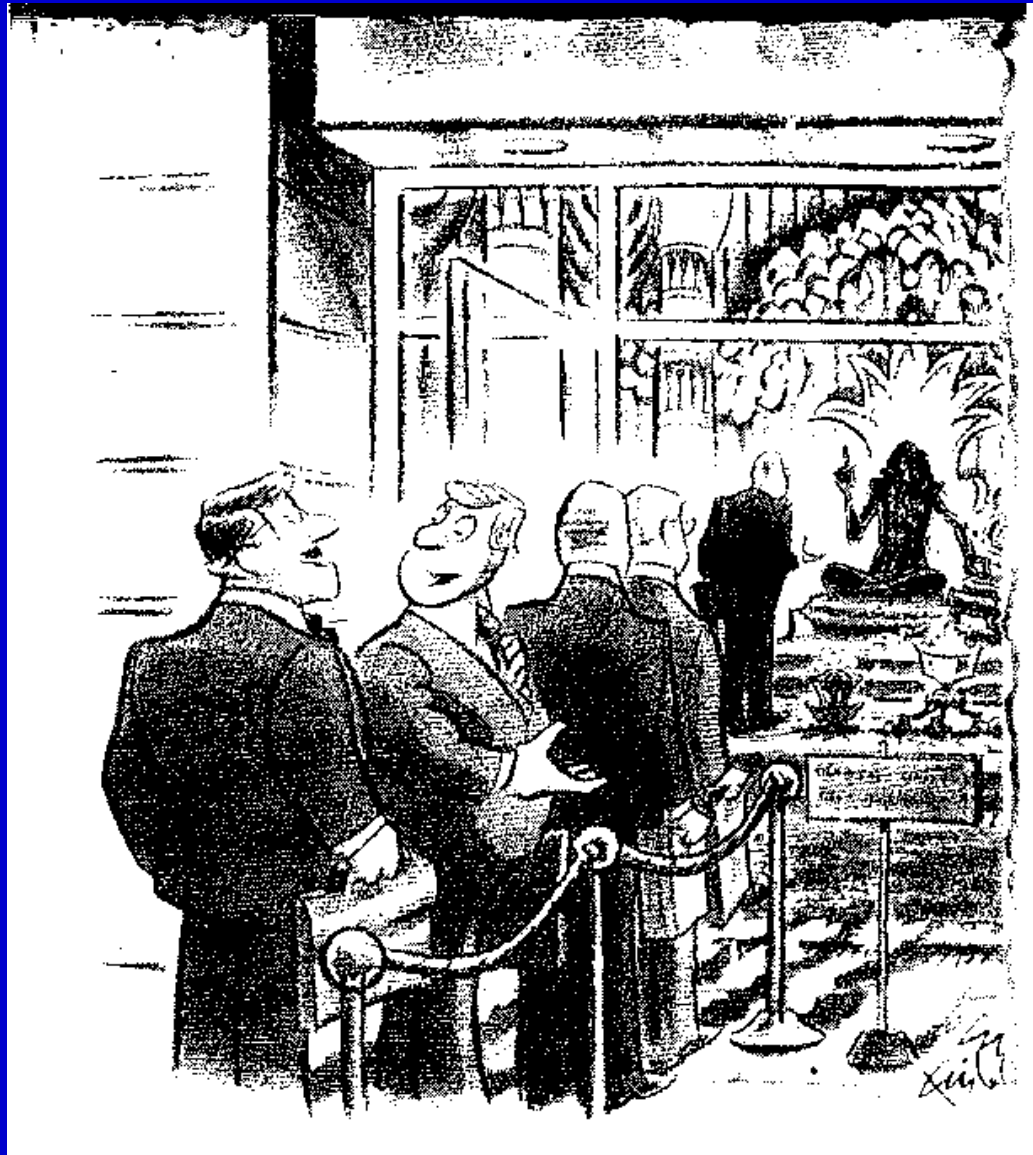








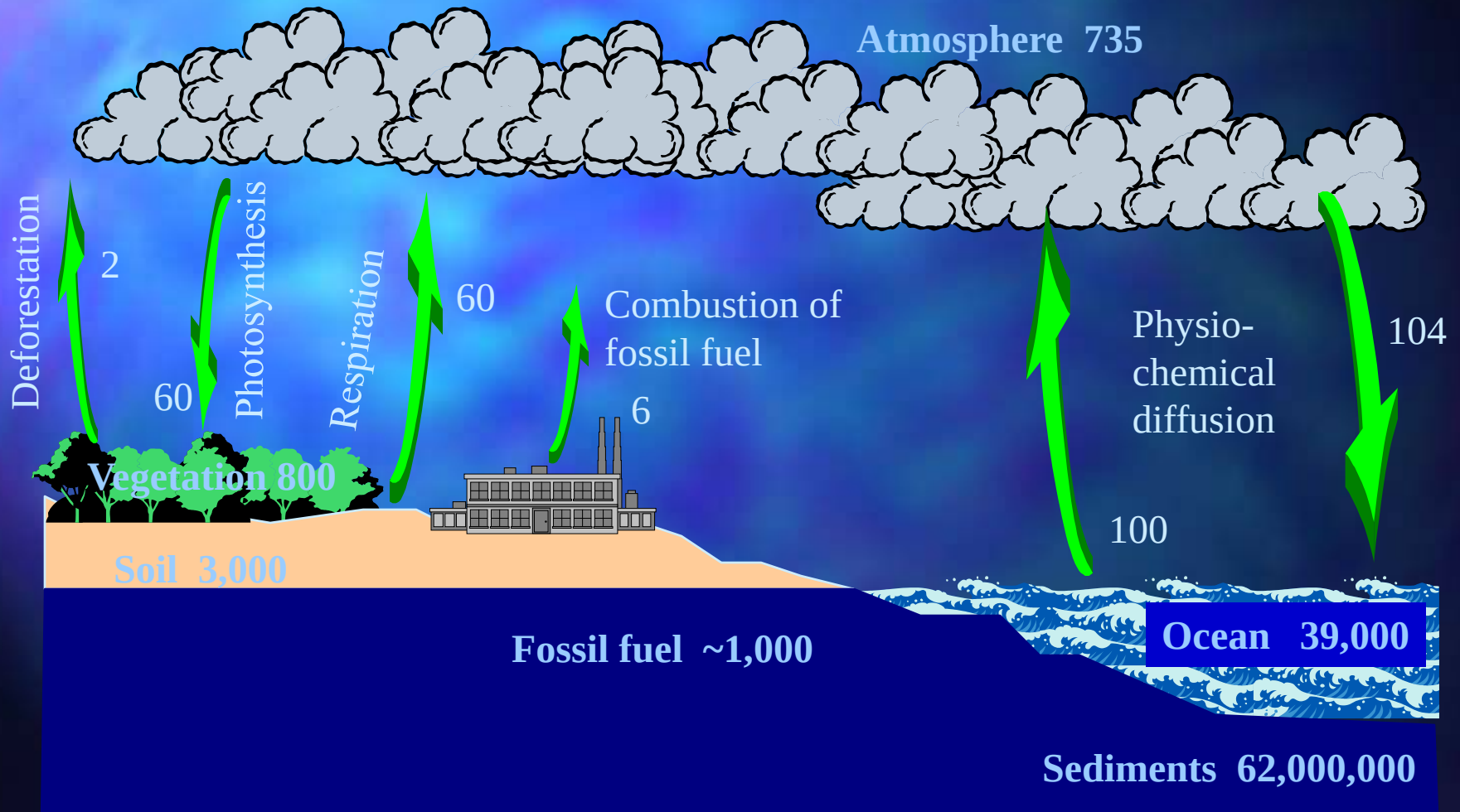




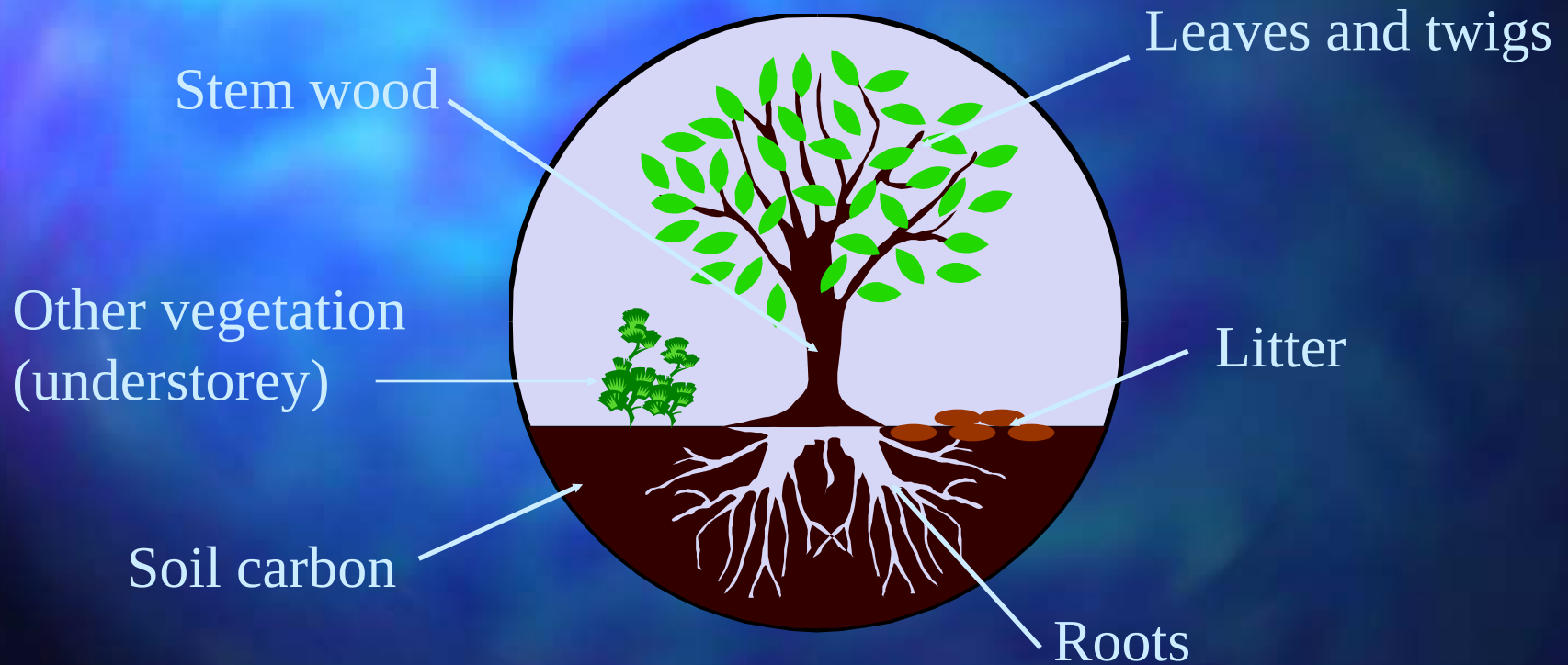
“It’s great! You just tell him how much pollution your company is responsible for and he tells you how many trees you have to plant to atone for it.”

Ed Fisher © 1989 The New Yorker Magazine

The carbon cycle

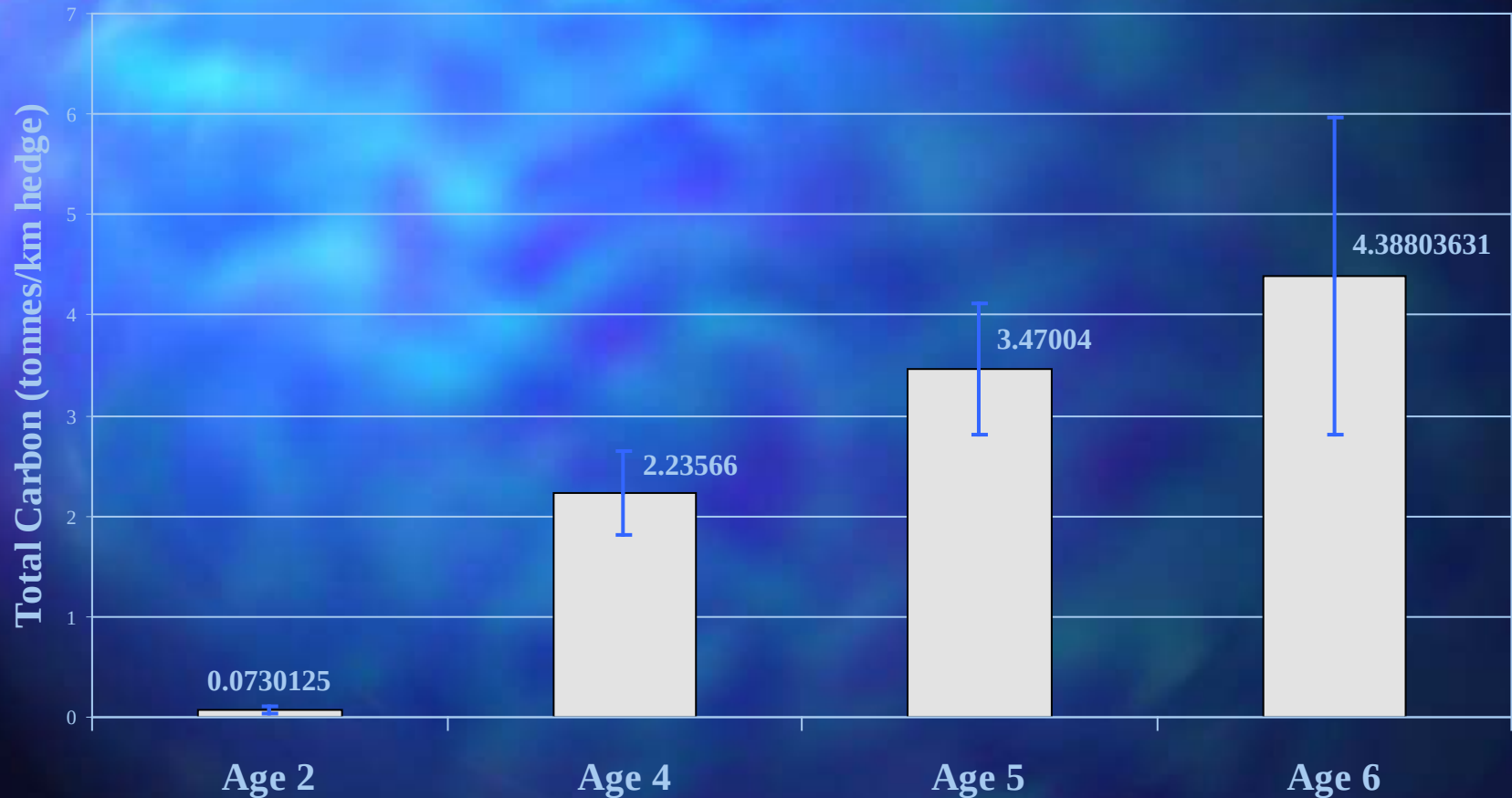


Major pools of forest carbon

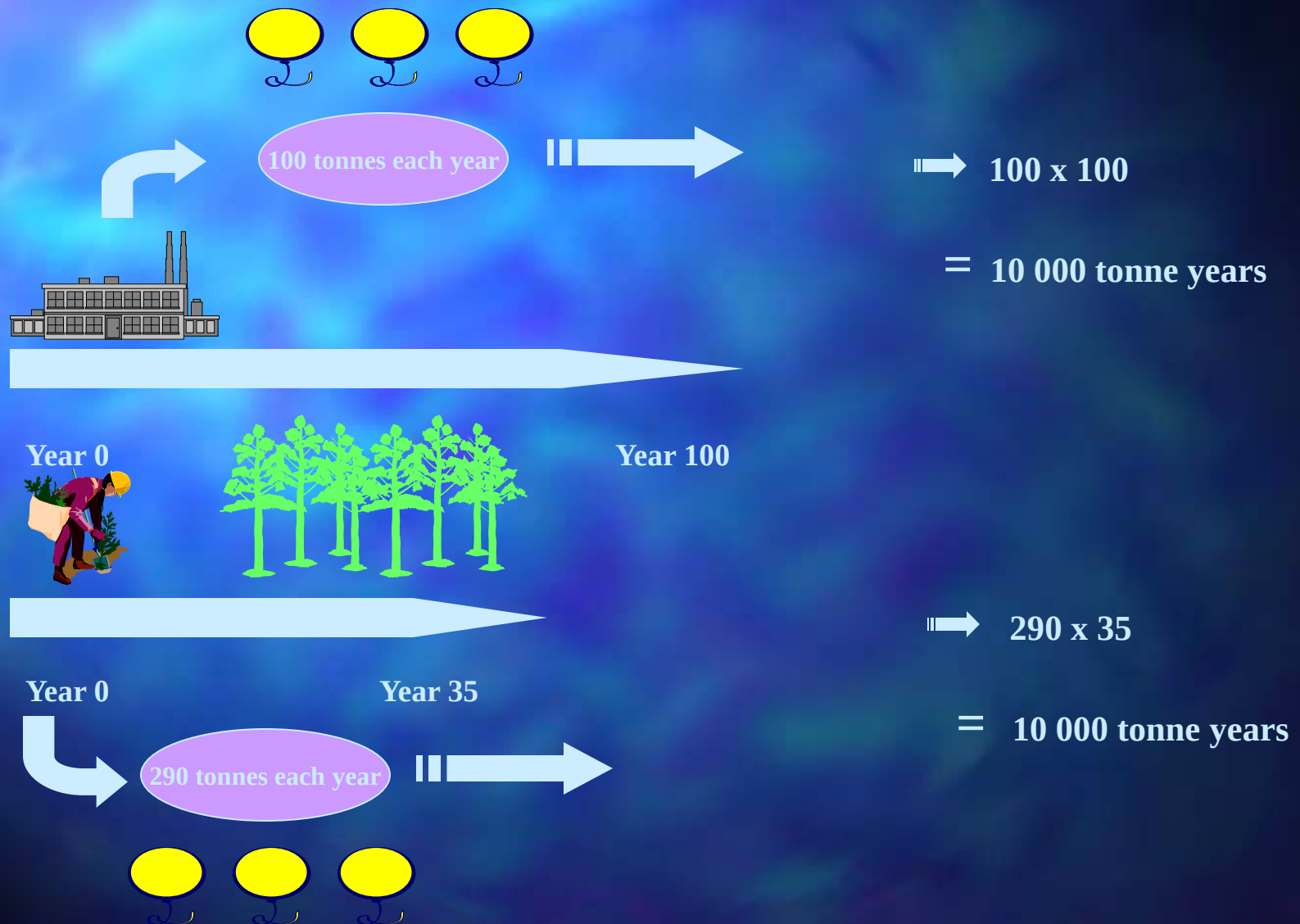


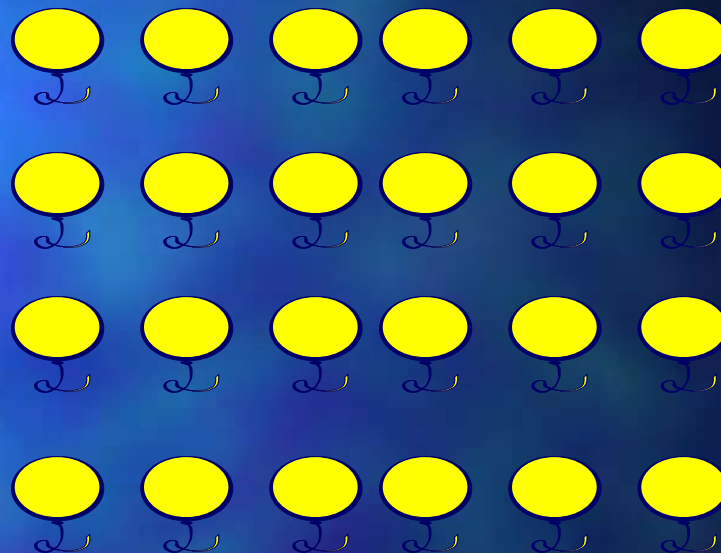
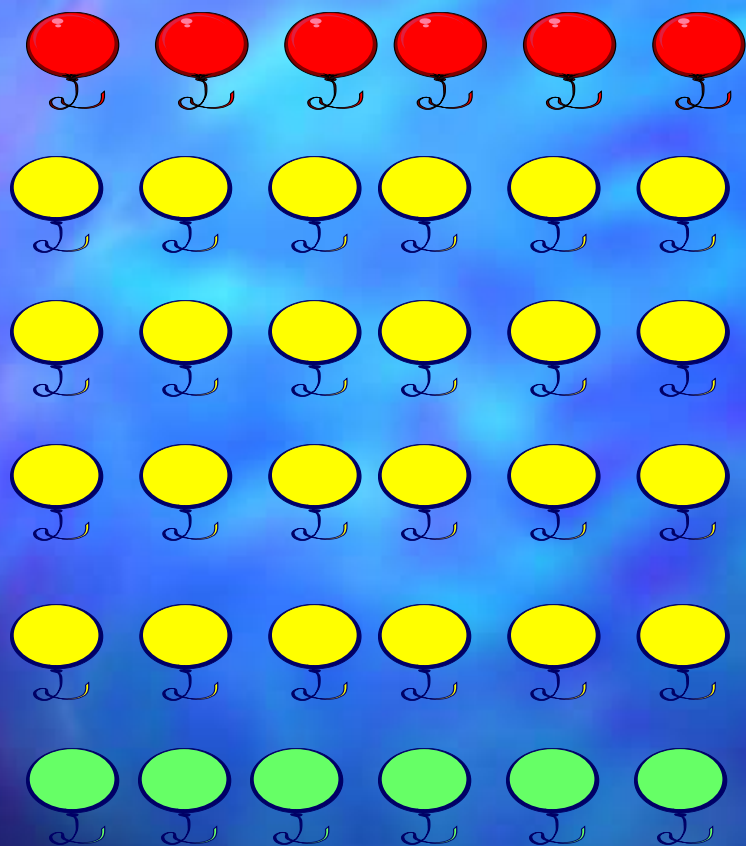


Total below ground carbon per kilometre of hedge for *Eucalyptus plenissima* at different ages with standard deviation

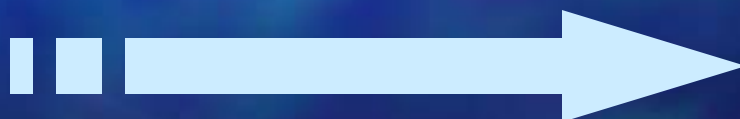


“Tonne-year” currency (Balance sheet of 1 year of emissions and storage)





1997



2097

Estimated tonnes and Carbon tonne years produced per hectare per year

	Carbon Tonnes per year	Average Carbon storage time (years)	Tonne years
Maritime pine	10	40	400
Bluegum	20	7.5	150
Mallee Stems	1	5	5
Roots	1	100	100
Biodiversity planting	2	50	100

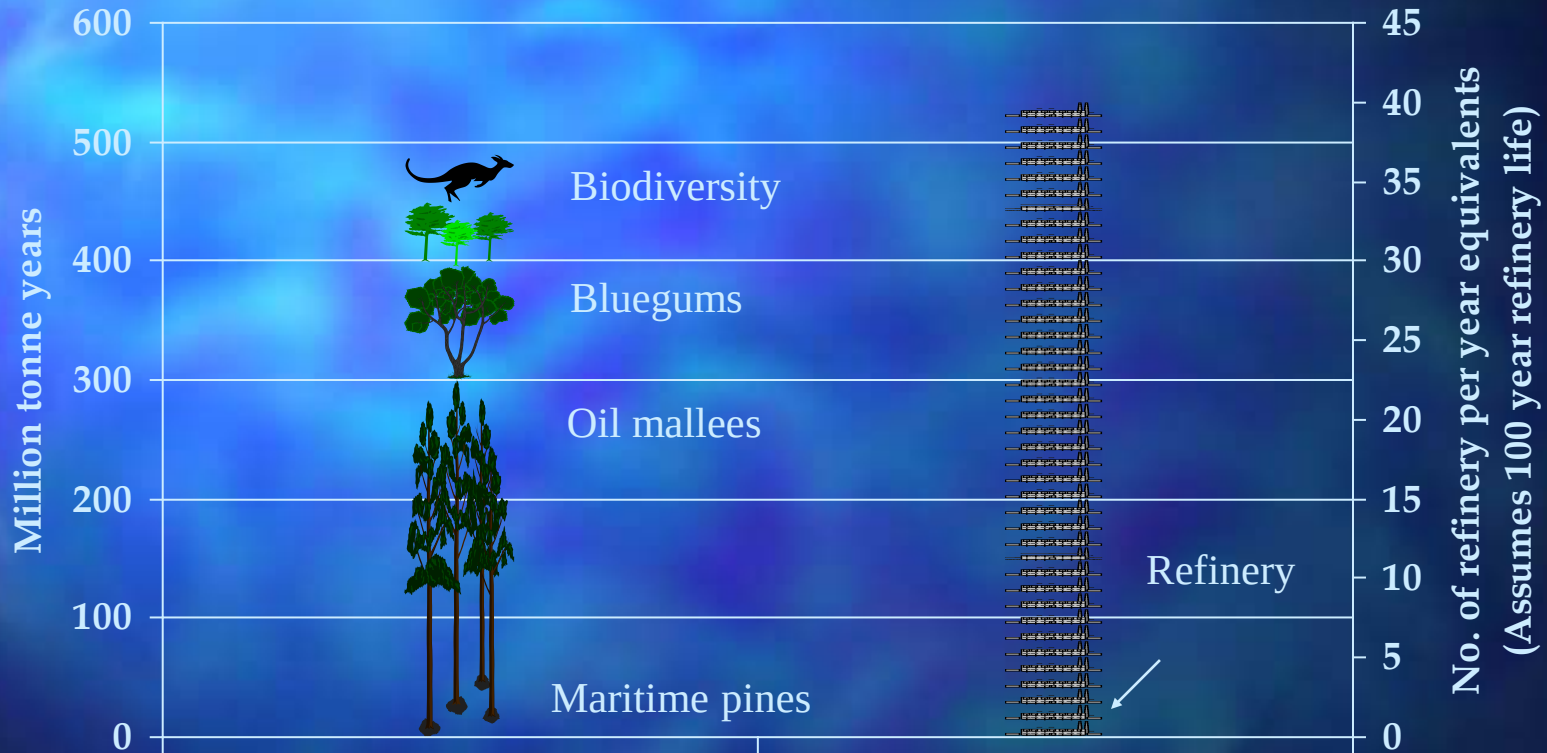
Farm forestry zones by area and rainfall

Farm forestry zone	Rainfall	Area (in million ha)
Traditional pine and new bluegum	>600 mm	2
New maritime pine	400 to 600 mm	6
Wheatbelt	<400 mm	10

Energy required to produce one tonne
of each product and tonnes of CO₂
emitted during production

	Energy (KWH equivalent)	CO ₂ Produced (tonnes)
Aluminium	15 000	25.0
Iron	3 000	2.5
Cement	2 000	0.3
Bricks	700	0.1
Timber	300	-0.2

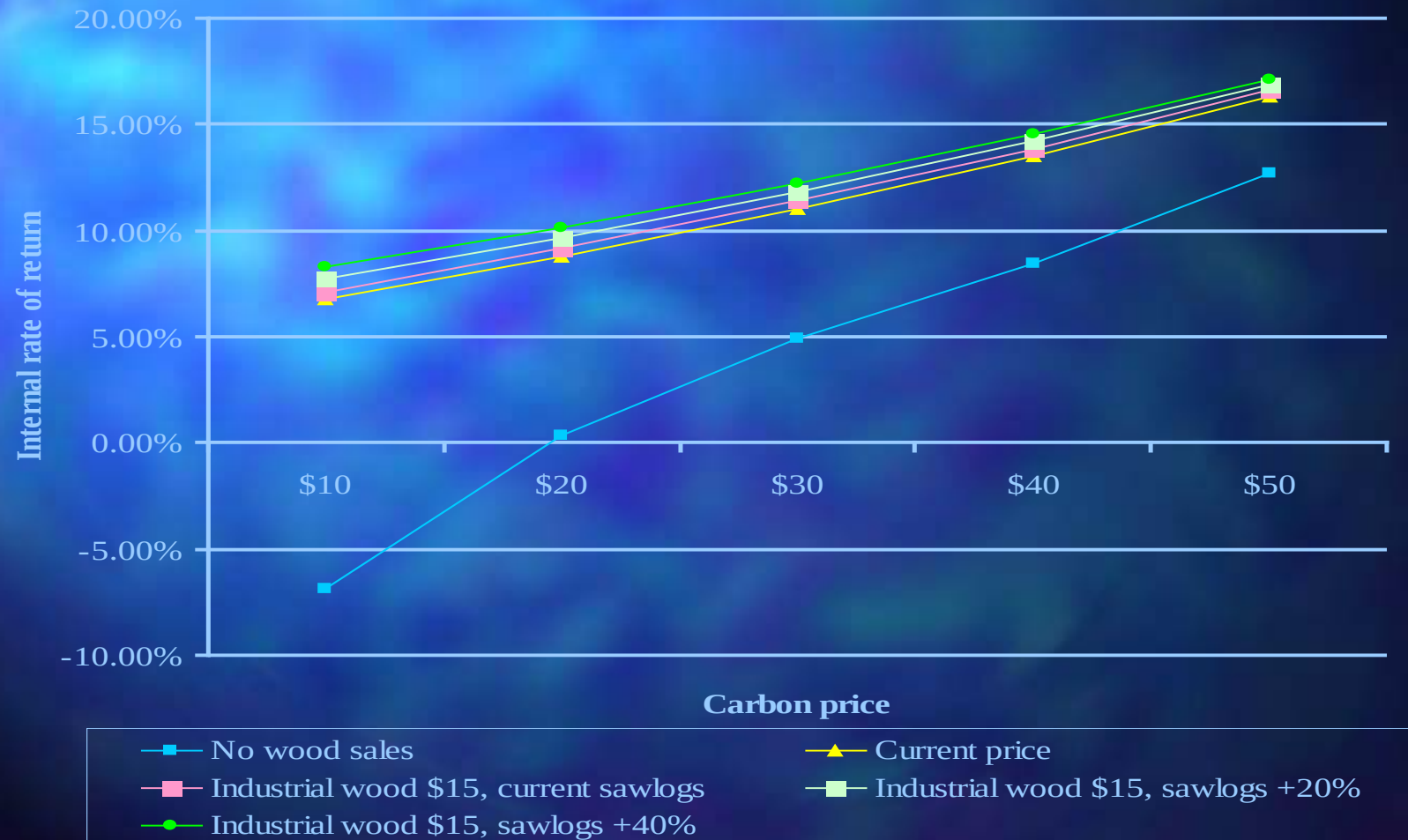
Optimistic Scenario



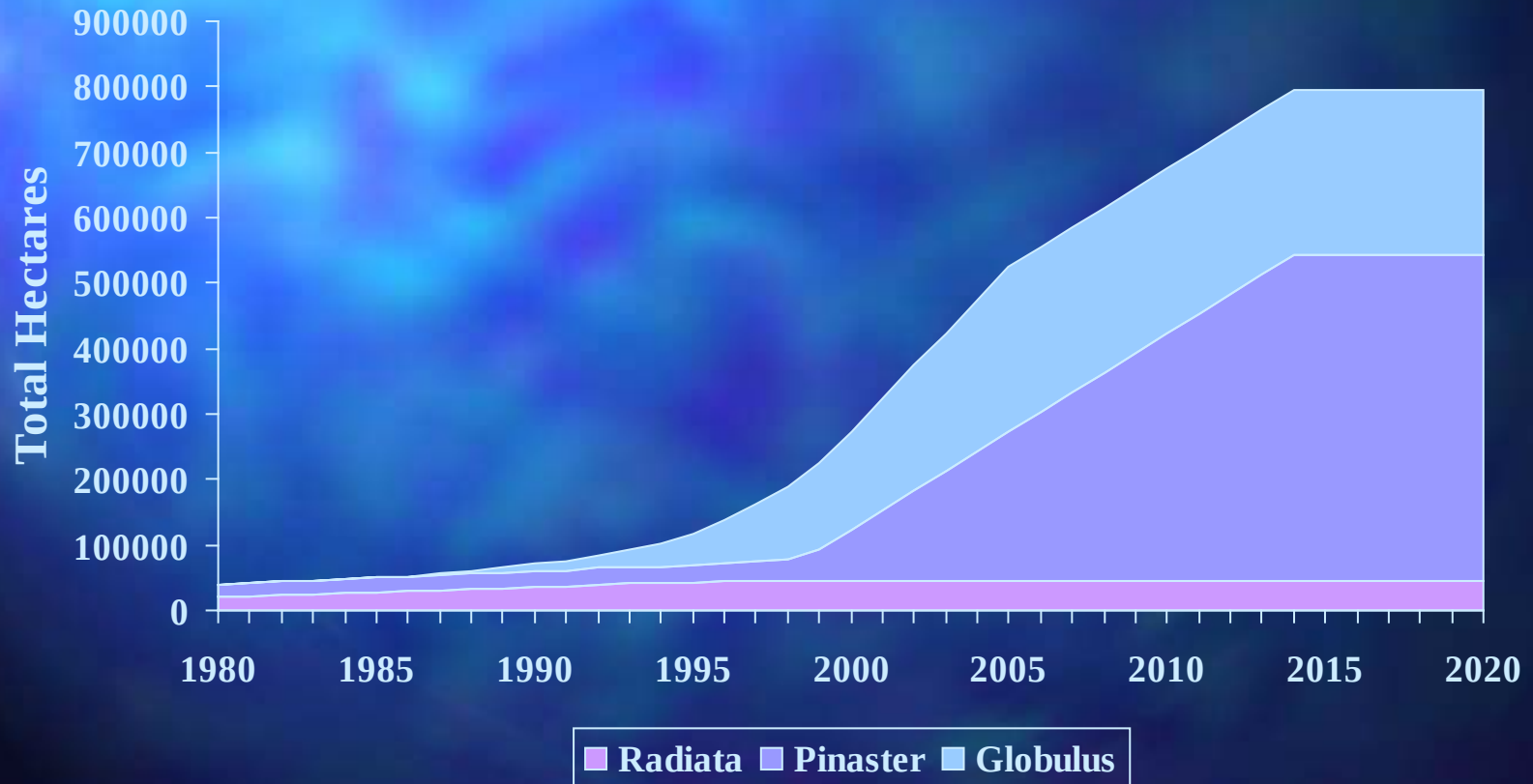
Assumptions

Half life of refinery,
double carbon storage times for pine, bluegum and biodiversity plantings

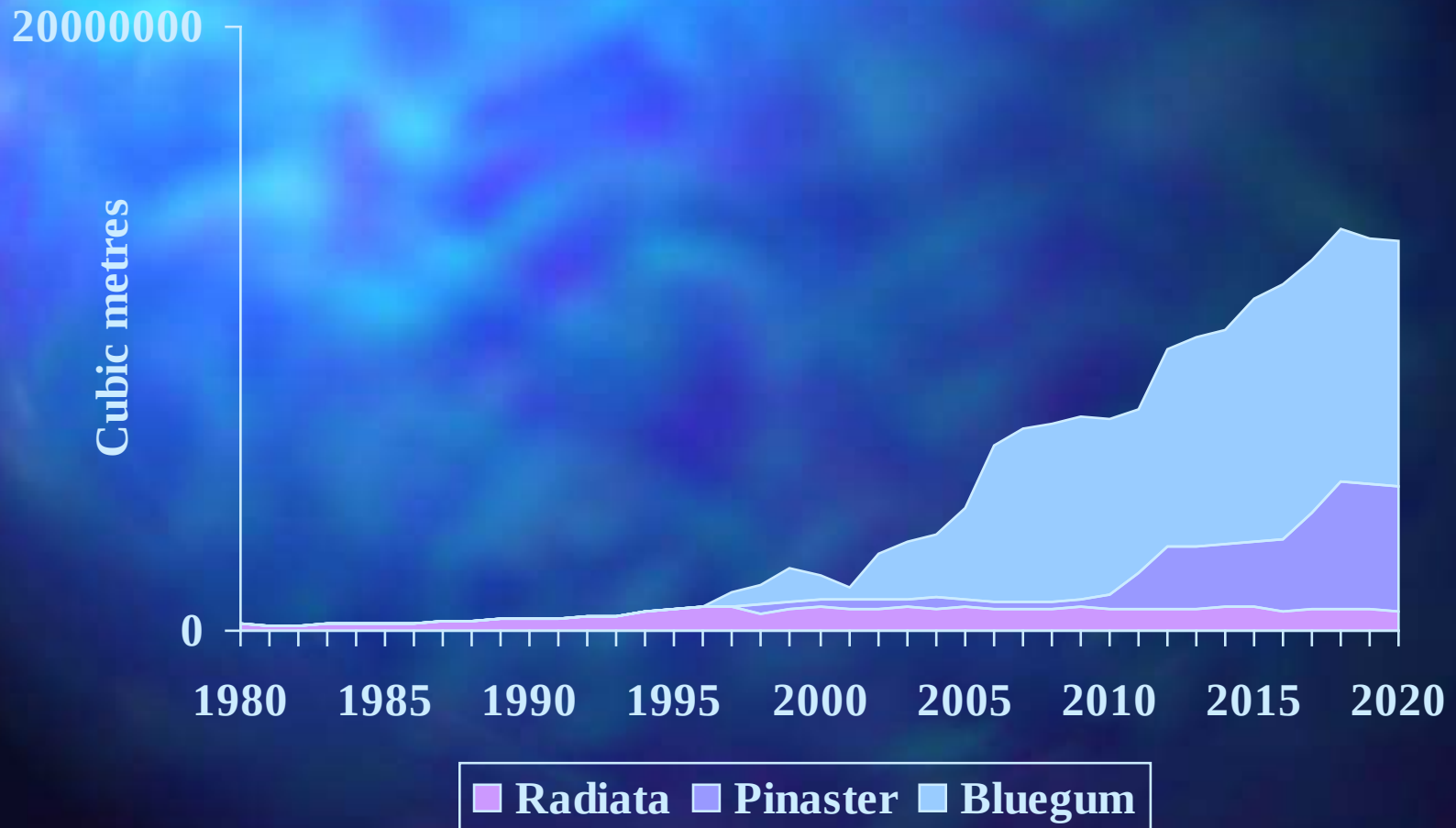
Effect of varying wood and carbon price on internal rate of return for 30 year rotation



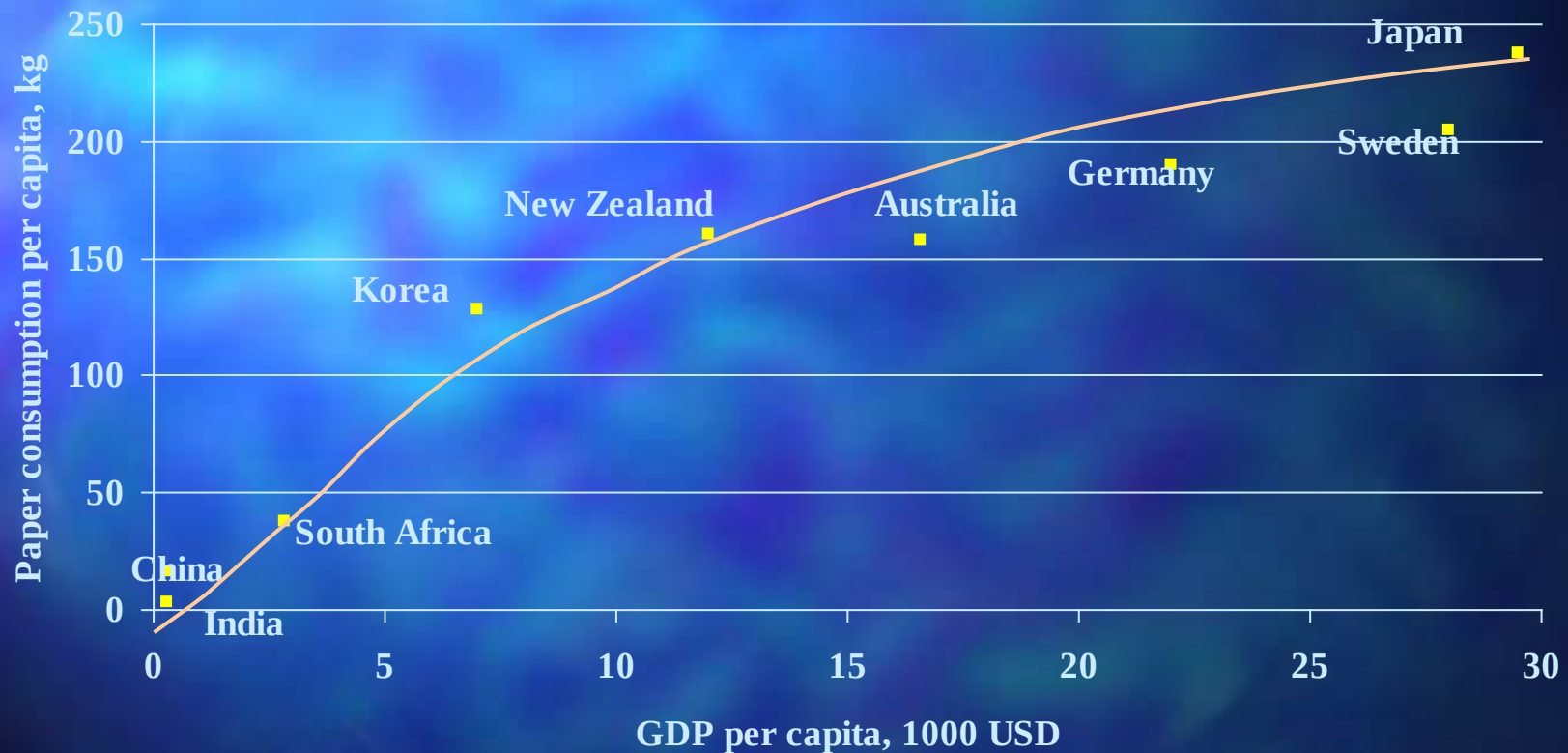
Predicted Growth of Tree Crop Plantings in Western Australia



Current and predicted wood fibre production from tree crops and plantations in Western Australia



GDP and paper consumption (for selected countries in 1992)

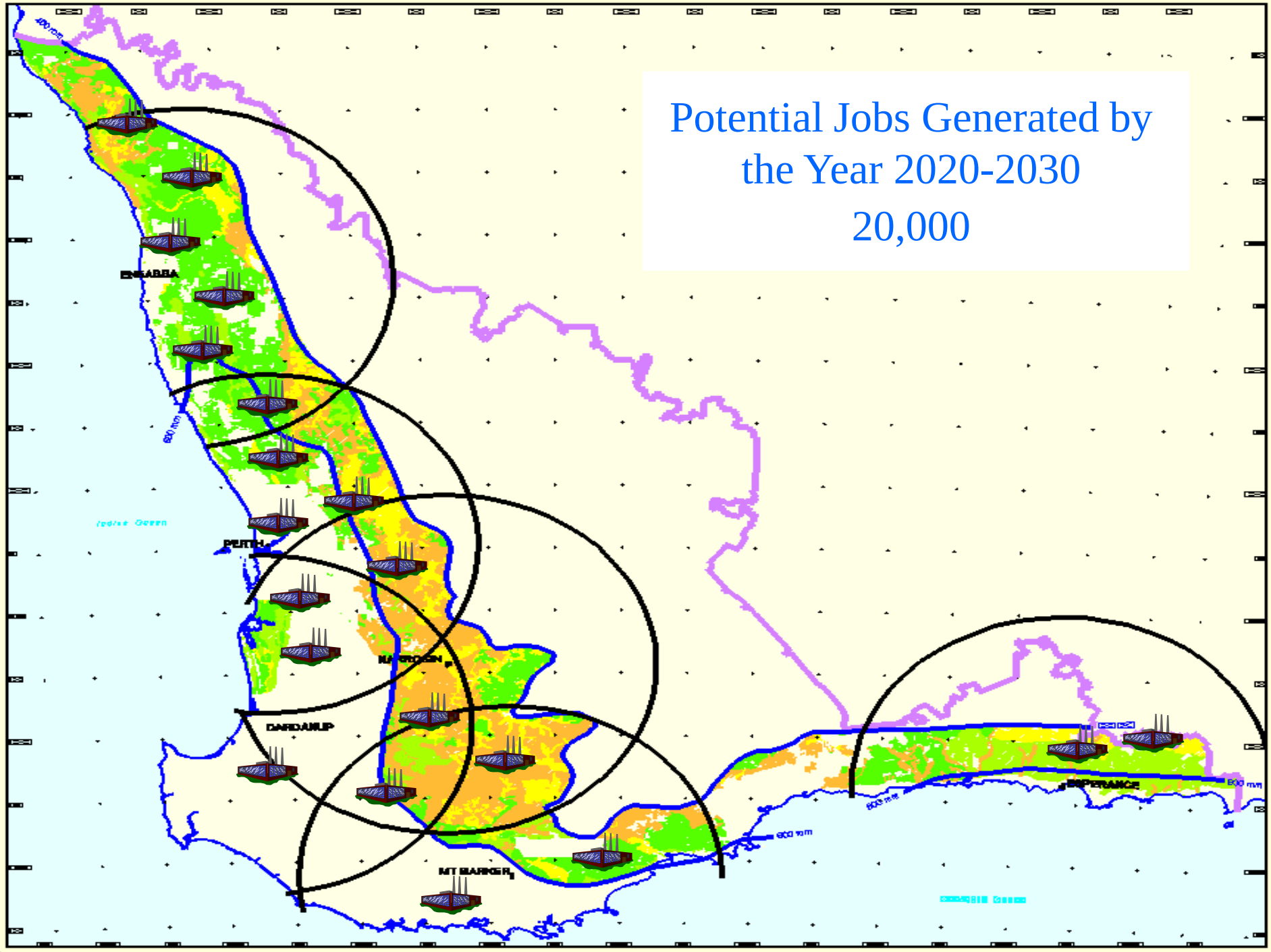


If growth 1990-96 (12% pa) continues, China will use the current world paper demand (279 million Mt) by 2015

Source: Jaakko Poyry
Dana Ltd



Potential Jobs Generated by
the Year 2020-2030
20,000



Water Drawdown under Bluegum Plantations compared to Pasture

