

The background image shows a field of young trees and shrubs, likely a tree island. A white marker post is visible on the left side. The text is overlaid on the image in three colored boxes.

Tree survival, growth and biomass in LILA tree islands

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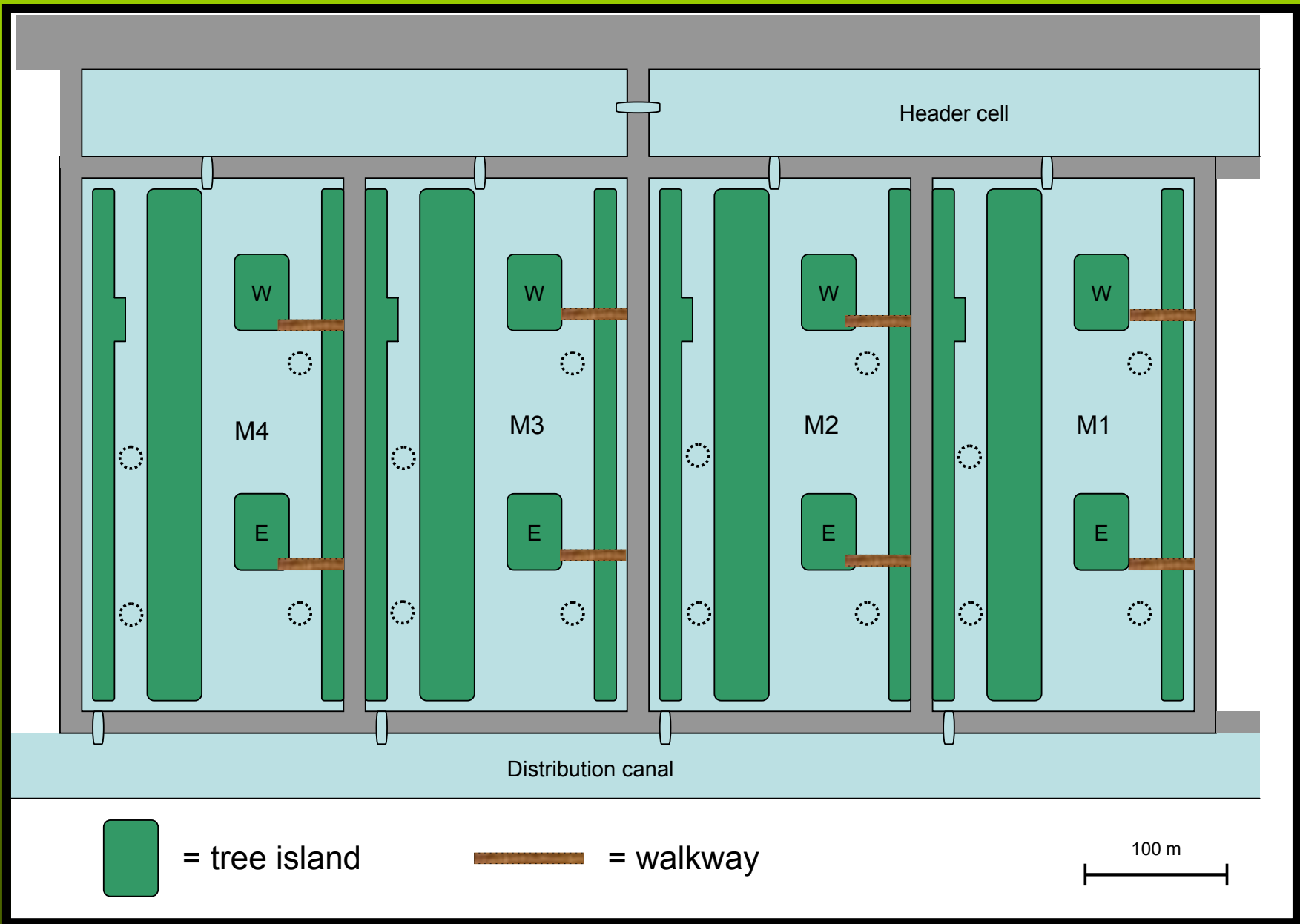
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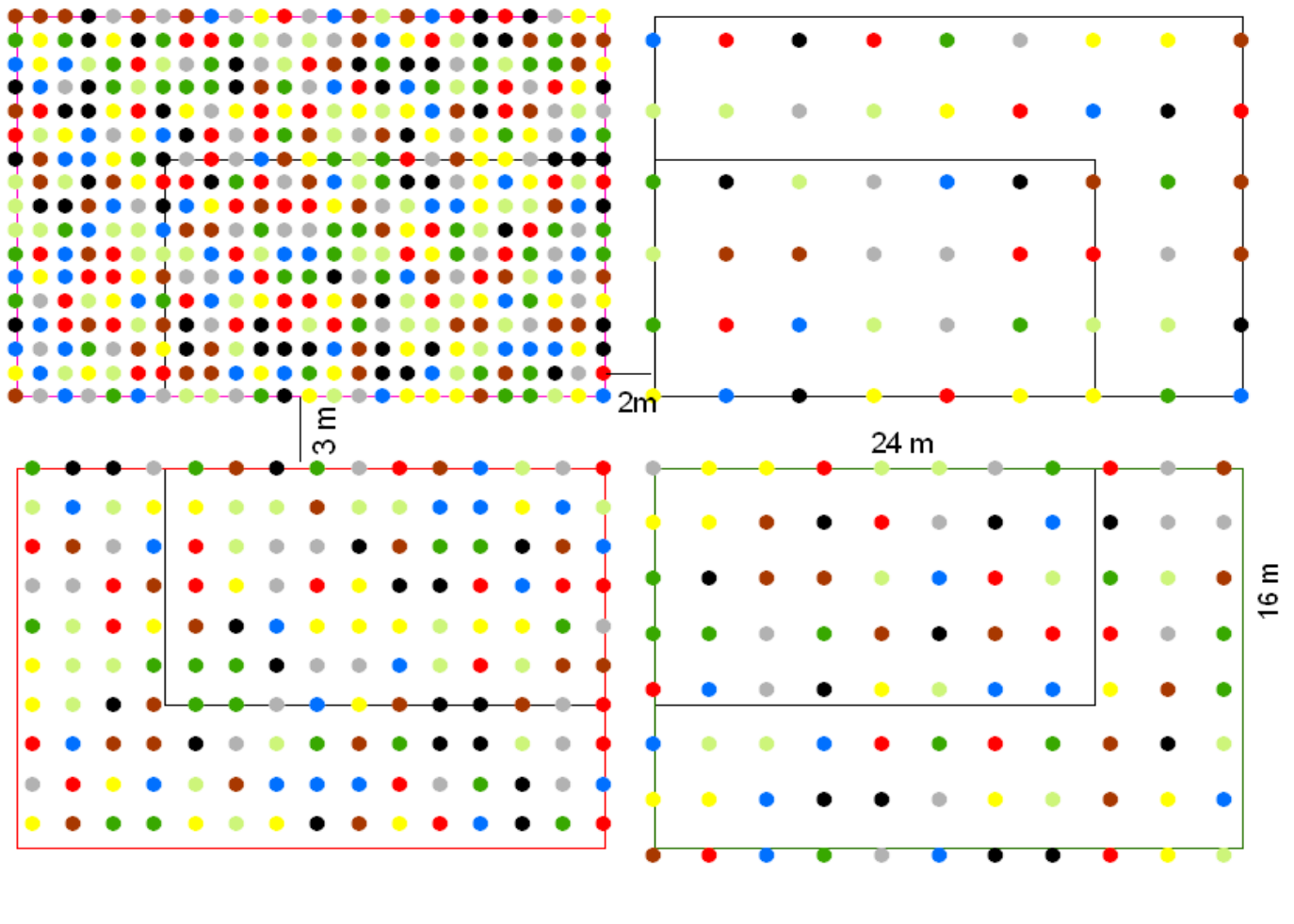
Objectives

1. Test hydrologic effects on seedling growth and survivorship
2. Determine, in the long term, the effects of tree spacing on individual tree and stand growth
3. Estimate tree biomass and nutrient content in order to understand its role in island formation and development





M1-E tree locations



- Legend:
Species**
- *Annona glabra*
 - *Acer rubrum*
 - *Bursera simaruba*
 - *Chrysobalanus icaco*
 - *Ficus aurea*
 - *Ilex cassine*
 - *Morella cerifera*
 - *Persea palustris*

□ High ground

	Cell-NW	Cell-SW	Cell-SE	Cell-NE
Spacing =	(1.00)	(1.67)	(2.33)	(3.00)
High =	209	77	40	28
Low =	216	73	48	26



Results

- **Survival**
- **Growth**
- **Biomass**



– All results are presented for combined microcosms M1&M4 and M2&M3

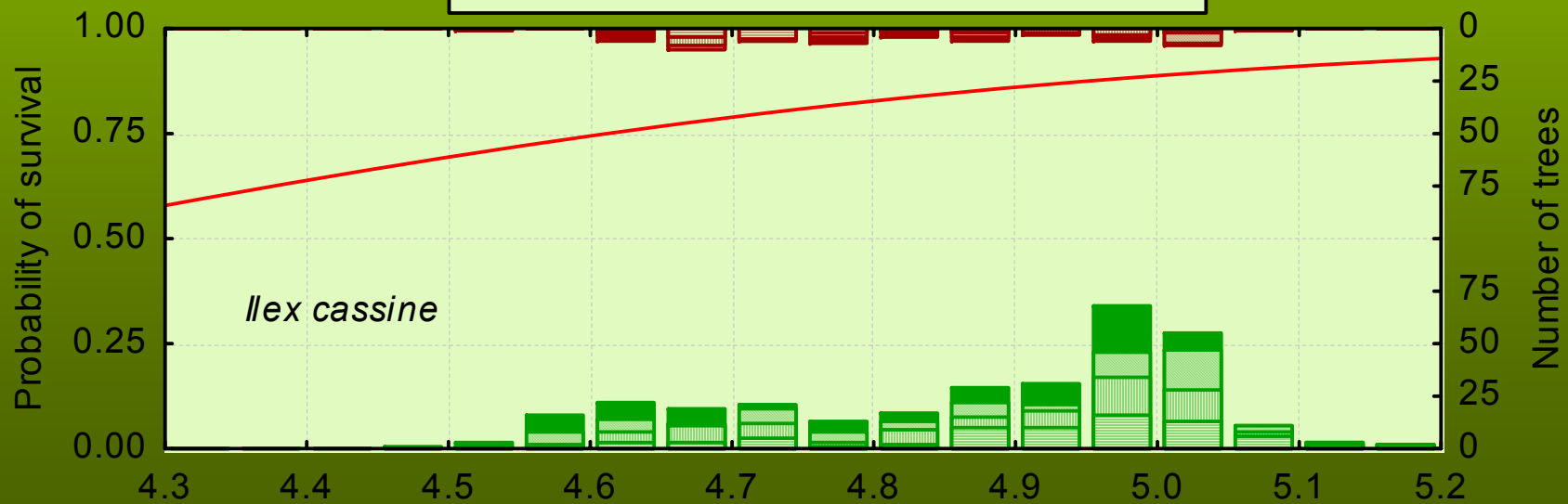
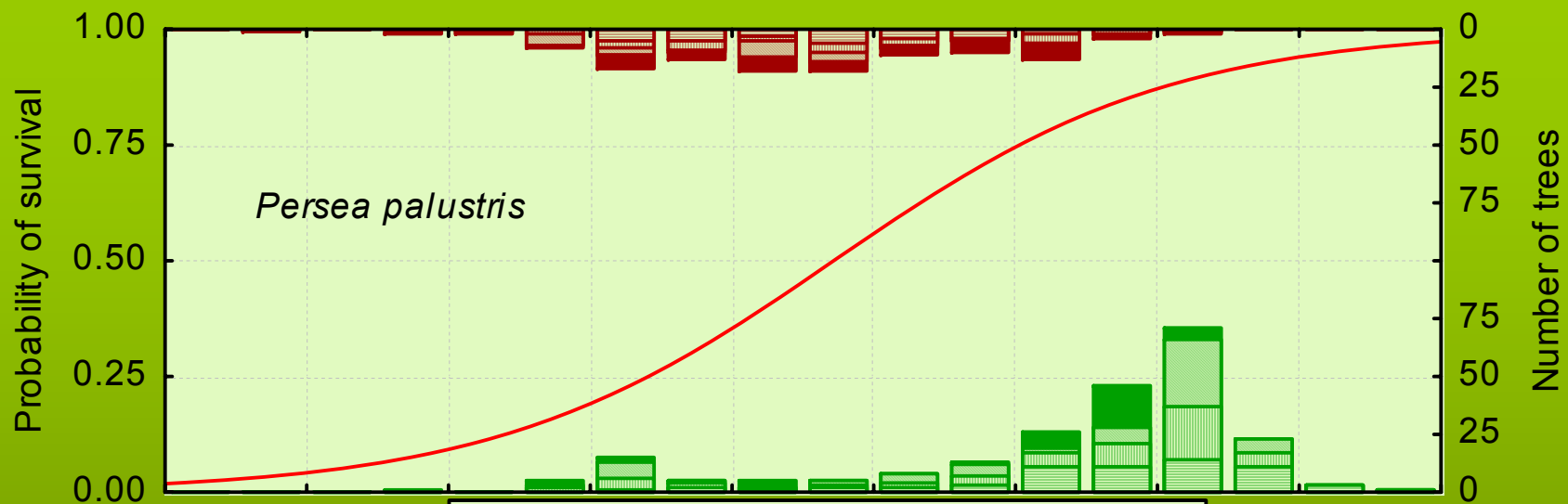


Survival

Species	M1E	M1W	M4E	M4W	Average
<i>Annona glabra</i>	82 (83)	86 (86)	81 (81)	11 (11)	65 (69)
<i>Acer rubrum</i>	93 (94)	98 (98)	95 (95)	97 (98)	96 (96)
<i>Bursera simaruba</i>	35 (40)	24 (24)	9 (9)	0 (0)	17 (18)
<i>Chrysobalanus icaco</i>	70 (72)	74 (75)	82 (85)	49 (55)	69 (72)
<i>Ficus aurea</i>	32 (35)	18 (18)	39 (41)	7 (12)	24 (27)
<i>Ilex cassine</i>	83 (83)	87 (90)	81 (83)	86 (89)	84 (86)
<i>Morella cerifera</i>	84 (88)	82 (82)	99 (100)	72 (77)	84 (87)
<i>Persea palustris</i>	68 (68)	70 (70)	73 (76)	49 (52)	65 (67)
Average	68 (75)	68 (68)	70 (71)	47 (50)	63 (65)

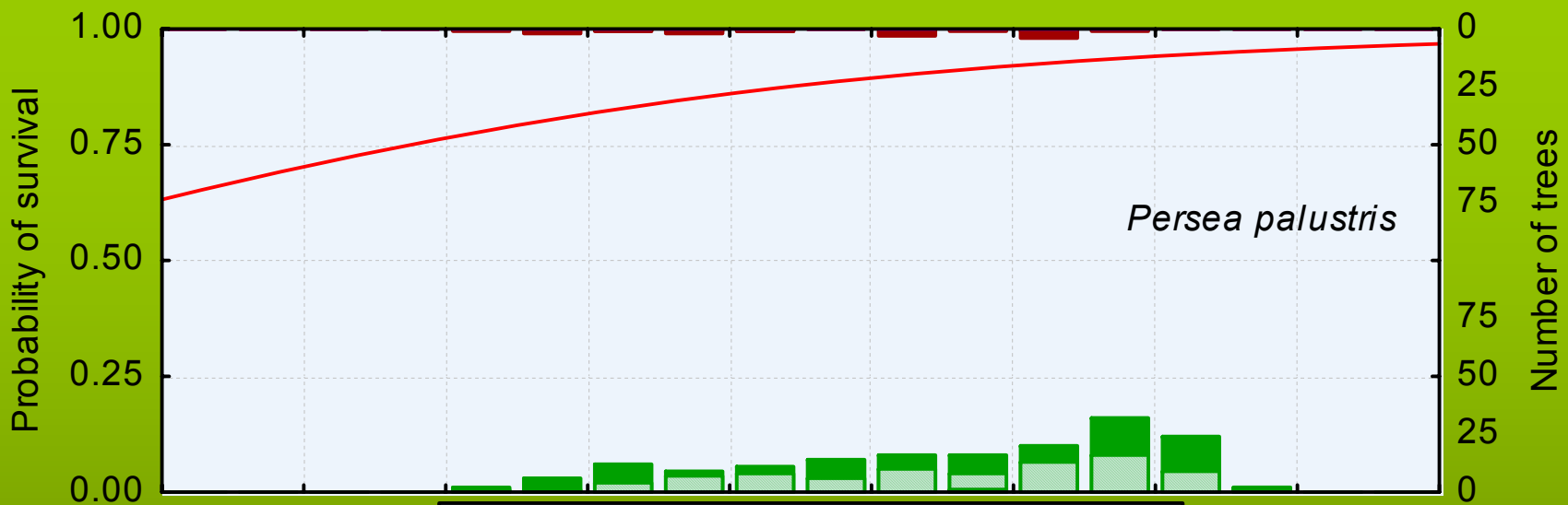
Species	M2E	M2W	M3E	M3W	Average
<i>Annona glabra</i>	38 (45)	55 (68)	92 (95)	43 (50)	57 (65)
<i>Acer rubrum</i>	100 (100)	100 (100)	100 (100)	99 (100)	100 (100)
<i>Chrysobalanus icaco</i>	77 (91)	80 (93)	91 (96)	78 (91)	82 (93)
<i>Eugenia axillaris</i>	96 (99)	97 (100)	80 (100)	90 (99)	91 (99)
<i>Ficus aurea</i>	65 (90)	70 (97)	78 (96)	64 (94)	69 (94)
<i>Ilex cassine</i>	95 (98)	93 (94)	92 (98)	92 (98)	93 (97)
<i>Morella cerifera</i>	93 (99)	95 (95)	93 (99)	99 (100)	95 (98)
<i>Myrsine floridana</i>	64 (88)	64 (94)	NP	NP	64 (91)
<i>Myrcianthes fragrans</i>	NP	95 (100)	62 (97)	NP	79 (99)
<i>Persea palustris</i>	NP	NP	97 (100)	87 (93)	92 (97)
Average	79 (89)	82 (94)	87 (98)	81 (91)	80 (93)



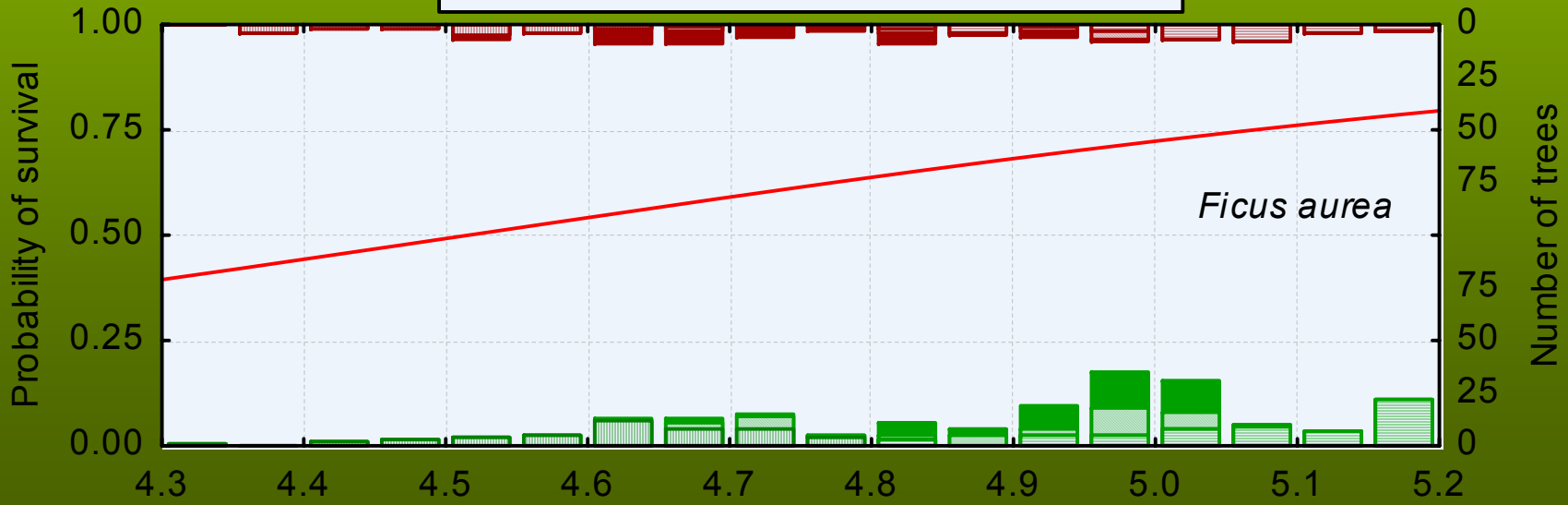


Elevation (m)





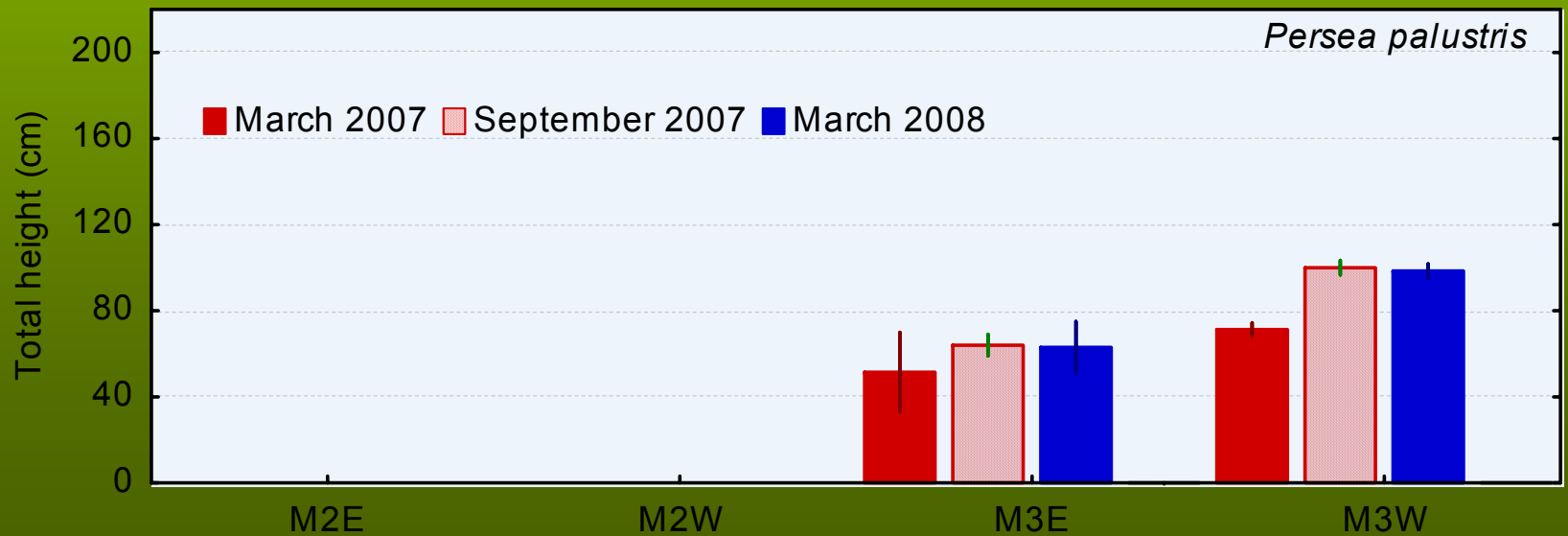
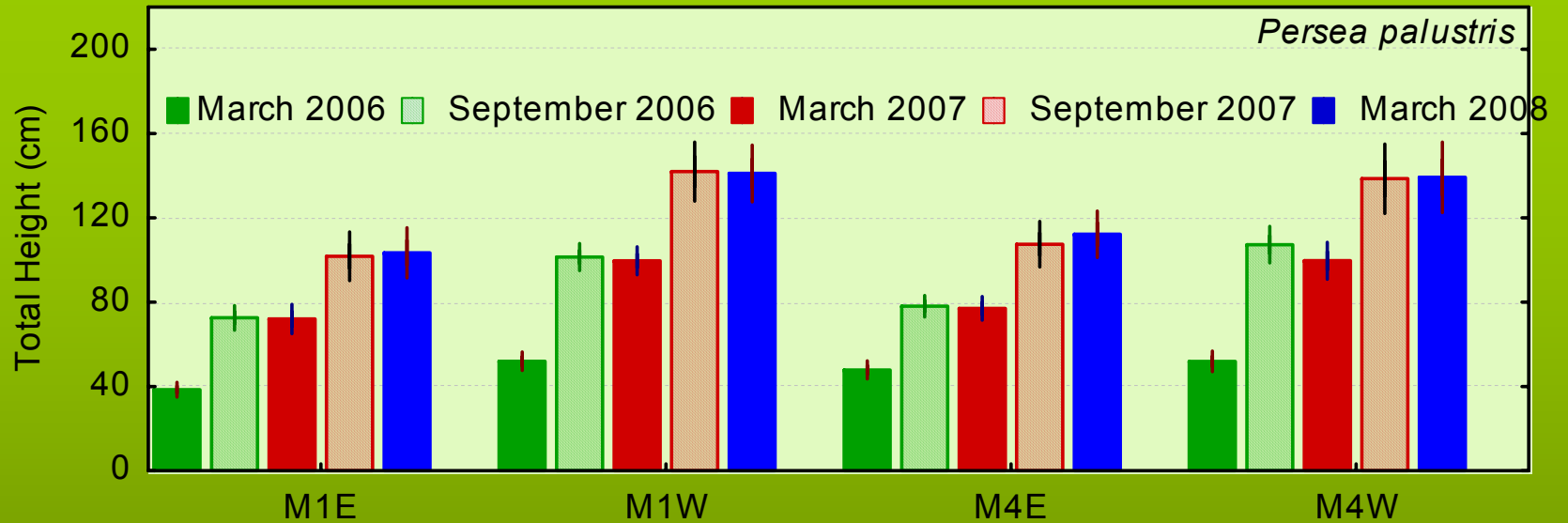
LIVE: M2E M2W M3E M3W
DEAD: M2E M2W M3E M3W



Elevation (m)

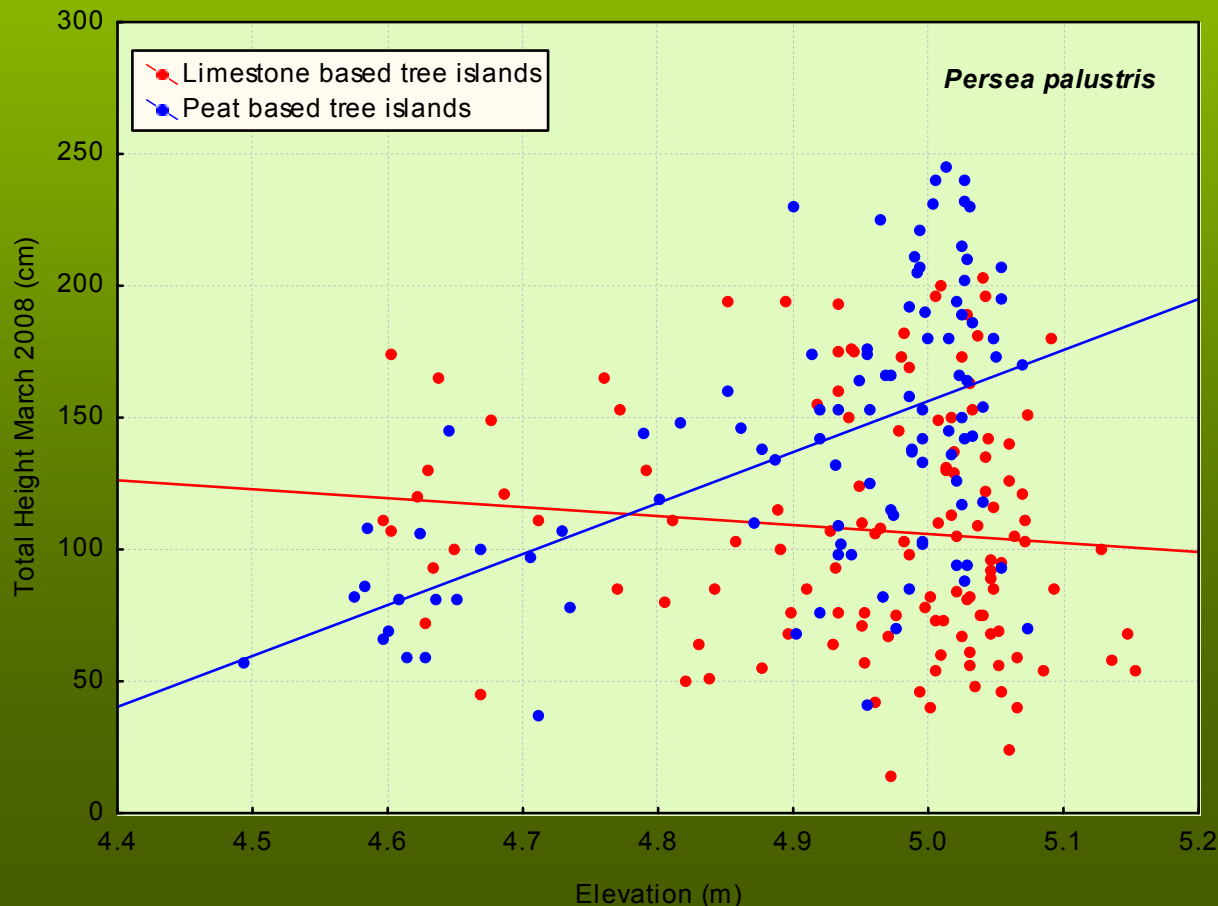


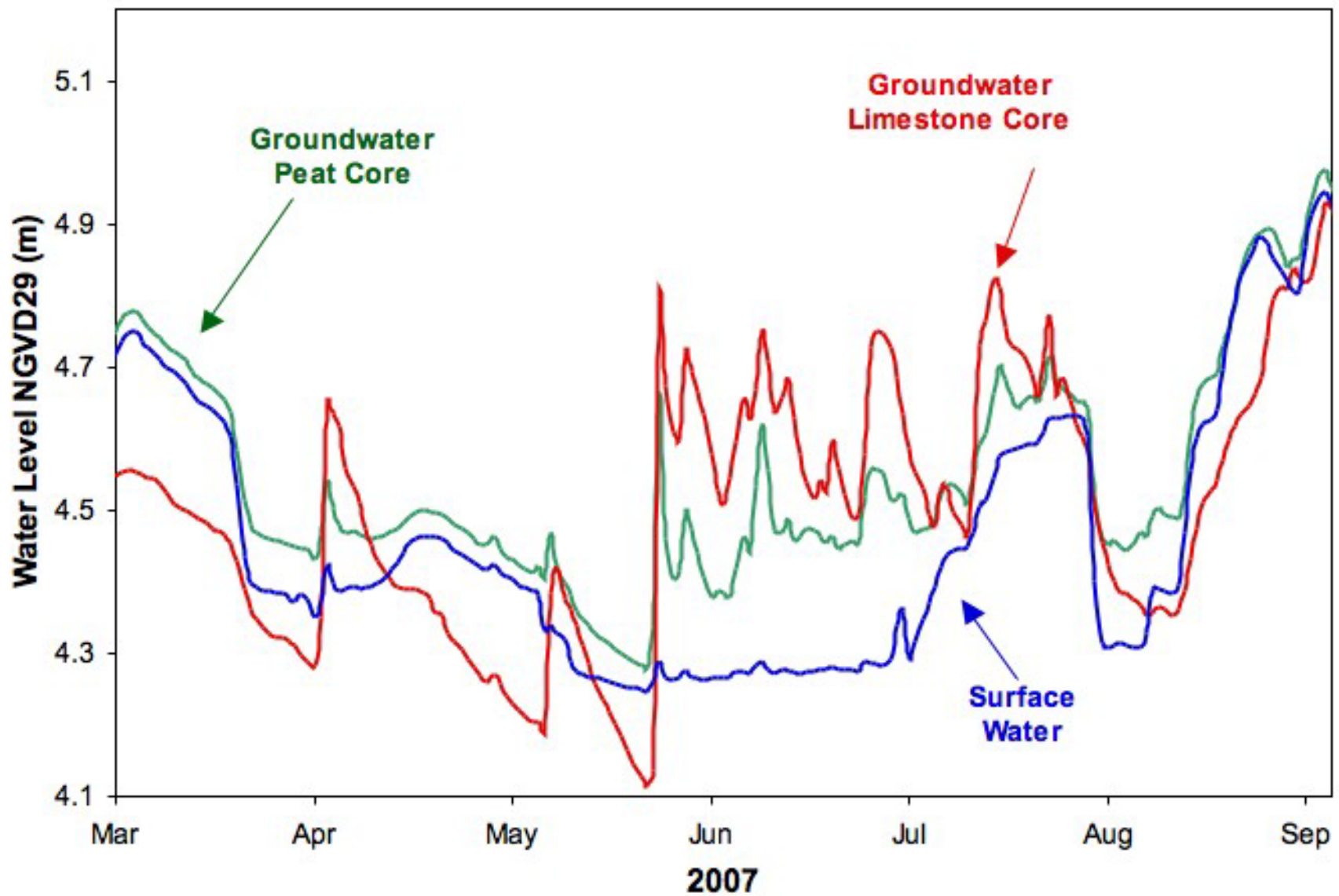
Growth



GLM ANOVA (p values) for effects of Elevation, Island Type and Density on March 2008 Total Height for all species in M1 and M4 tree islands.

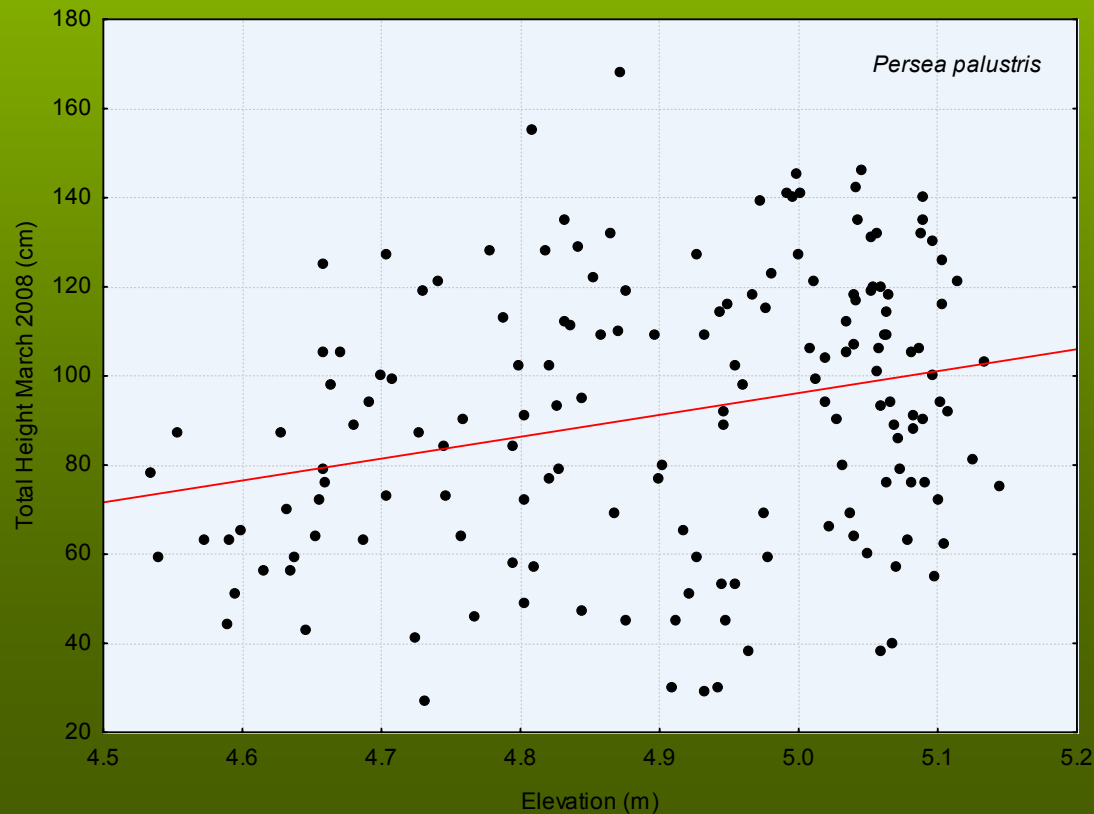
	AG	AR	BS	CI	FA	IC	MC	PP
Island Type	0.00	0.00	0.45	0.87	0.12	0.01	0.06	0.00
Density	0.36	0.91	0.11	0.00	0.59	0.45	0.84	0.60
Elevation	0.00	0.51	0.56	0.00	0.21	0.00	0.00	0.00
Island Type*Density	0.55	0.08	0.89	0.42	0.33	0.18	0.35	0.87
Island Type*Elevation	0.00	0.00	0.43	0.86	0.11	0.01	0.06	0.00
Density*Elevation	0.41	0.95	0.12	0.00	0.58	0.43	0.77	0.60
Is.Type*Density*Elevation	0.50	0.08	0.88	0.44	0.33	0.18	0.34	0.93



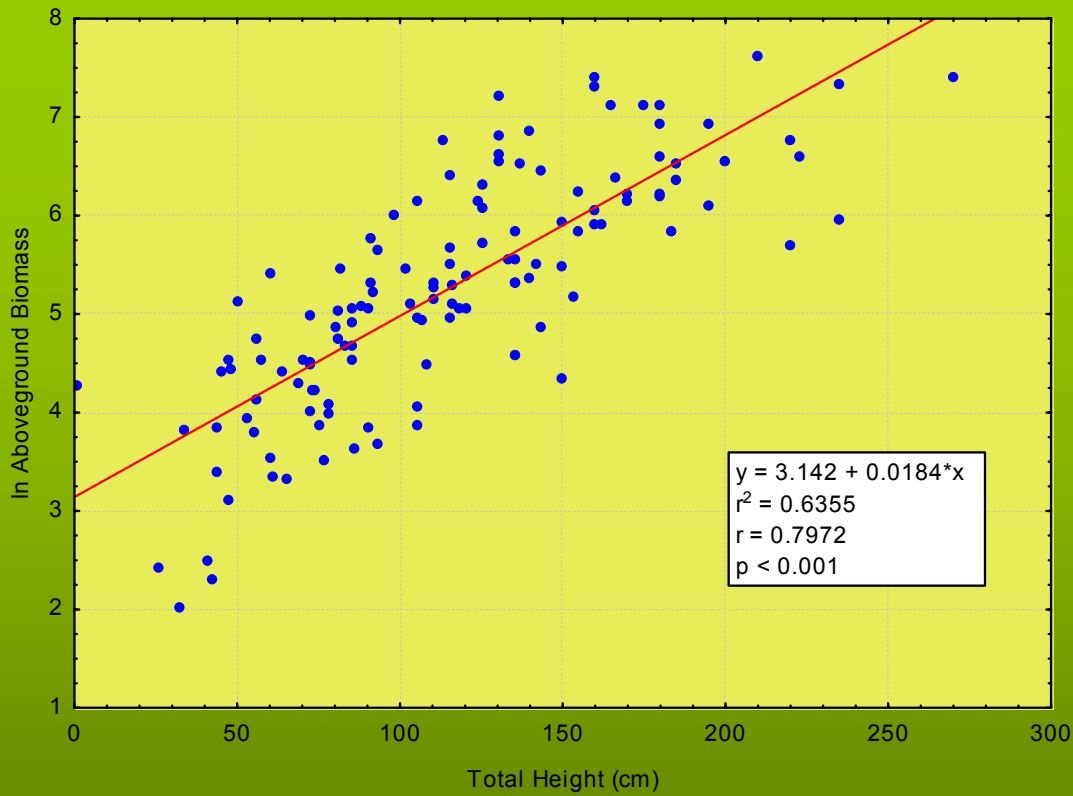


GLM ANOVA (p values) for effects of Elevation, Island Type and Density on March 2008 Total Height for all species in M2 and M3 tree islands.

	AG	AR	CI	EA	FA	IC	MC	MFI	PP
Island Type	0.00	0.65	0.34	0.01	0.55	0.96	0.21	0.28	0.72
Density	0.13	0.09	0.02	0.80	0.95	0.06	0.42	0.60	0.93
Elevation	0.01	0.11	0.00	0.29	0.53	0.00	0.14	0.75	0.00
Is.Type*Density	0.00	0.86	0.53	0.89	0.98	0.03	0.10	0.62	0.99
Is.Type*Elevation	0.00	0.72	0.44	0.01	0.55	0.96	0.24	0.25	0.64
Density*Elevation	0.08	0.07	0.01	0.77	0.97	0.06	0.40	0.55	0.90
Is.Type*Density*Elevation	0.00	0.86	0.58	0.86	0.97	0.03	0.09	0.58	0.98



Biomass



Conclusions

- Cumulative average survival for all species was 63% and 80% after two years and one year from planting, respectively
- Survival was affected by elevation in several species
- Height growth of several species reflected an effect of hydrology
- Seasonal growth pattern was evident, i.e., rapid in the wet season, slower during the dry season
- Total height was a good predictor of tree biomass across species

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