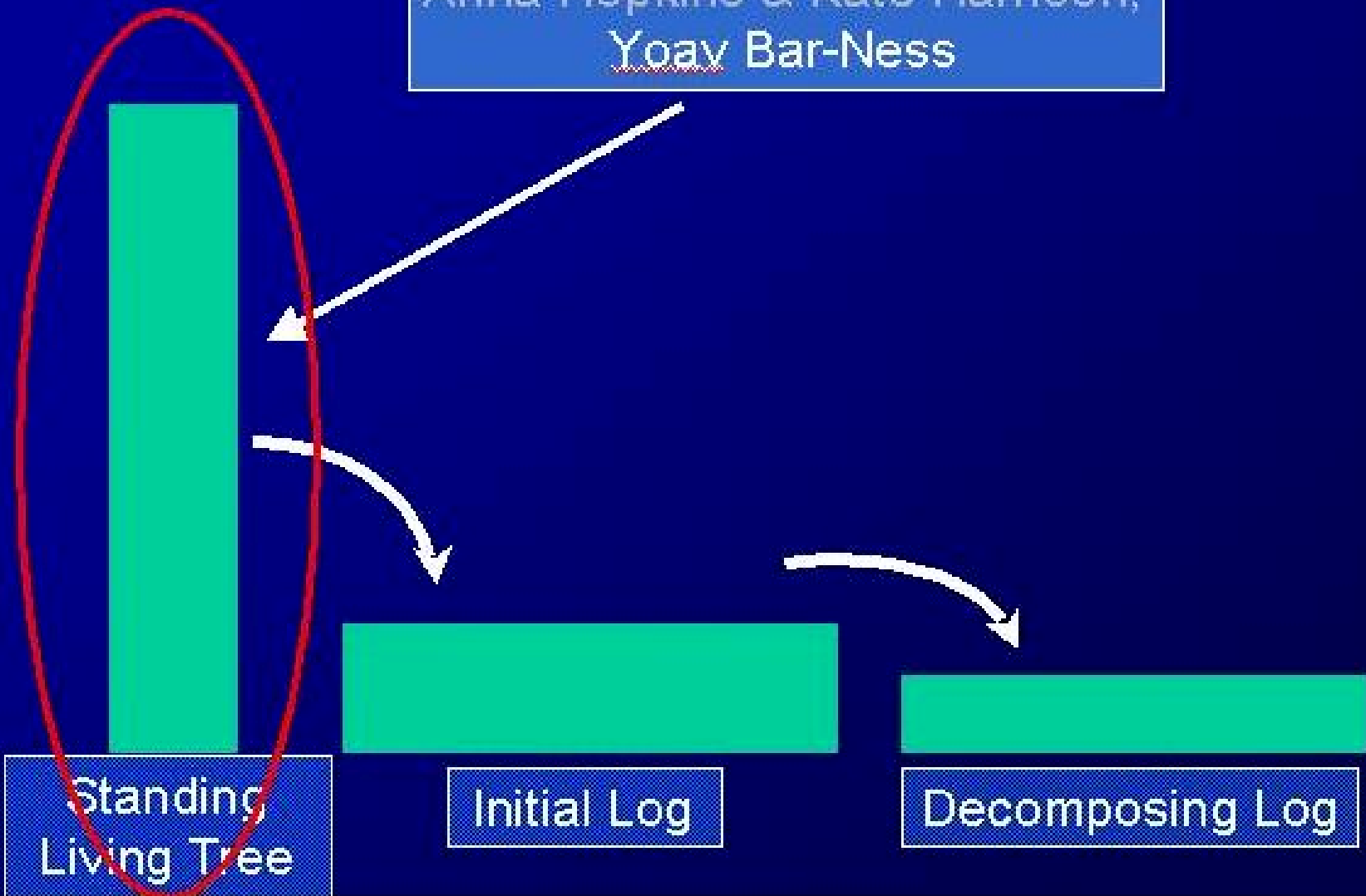


Project Overview

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Crown Structure and Canopy Arthropods of *Eucalyptus obliqua*

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- Question and Design
- Age Classes and Access
- Mapping: Surveying
- Mapping: Results
- Trapping: Design
- Trapping: Results
- Correlations
- Conclusions

Question?

What are the differences in...

1) Canopy
arthropods

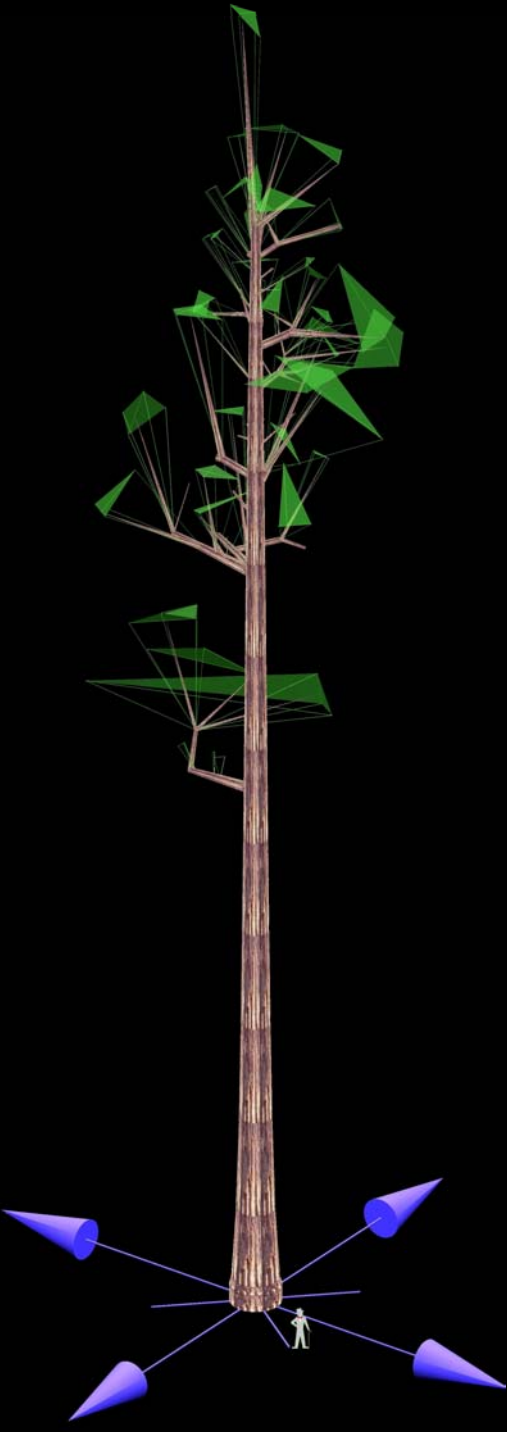
2) Crown
Structure

3) Habitat
Presence

...between old-growth and 100 year old
Eucalyptus obliqua trees?

Design

- West End of Manuka Road at Warra LTER, Tas.
- Ages standing together controls external factors
- Study nearby pairs of old and 100y trees
- Eight pairs = Sixteen trees trapped Jan-Mar 04
- E1 and ER5 Aerial PI maps



Age Classes



100yr

- Healthy primary crown
- Live tops
- Regular branch competition
- Avg ht: 44.5m
- DBH: 1.0m
- Vol: 14.1m³

Old

- Original + epicormic branches
- Dead tops, decay
- Crown fire secondary crown OR senescent primary crown
- Avg ht: 60.8m
- DBH: 2.8m
- Vol: 97.3m³

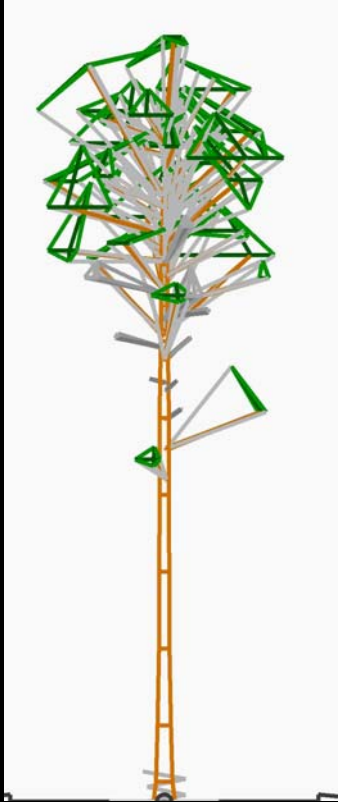


Access

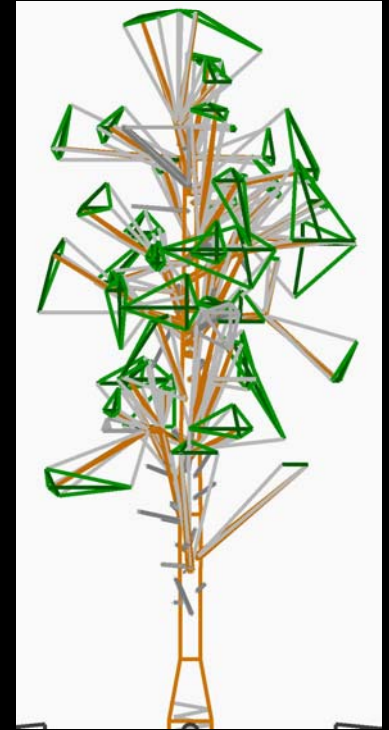
- Undisturbed crown requires direct access
- Rope techniques used by arborists, cavers
- Study bias towards safe trees



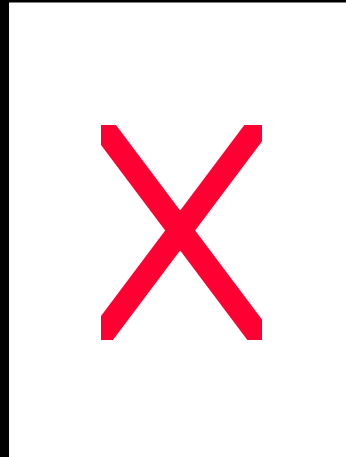
Mapping: Surveying



- Crown maps of 3-d vectors
- Branch girth, health, foliage, features, and traps
- Detailed numerical descriptors of each tree
- Quantitative differences
- 3-d computer arborograph models
- Illustration of interbranch dynamics



Mapping: Features

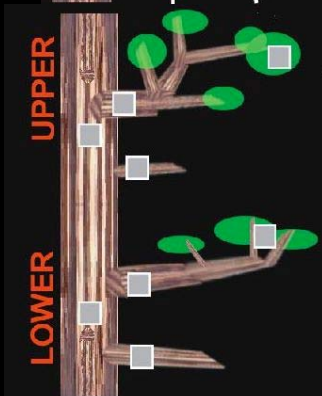


- Survey of habitat features
- Subject to biases of recognition, distinction, and access
- All features were more abundant in old trees

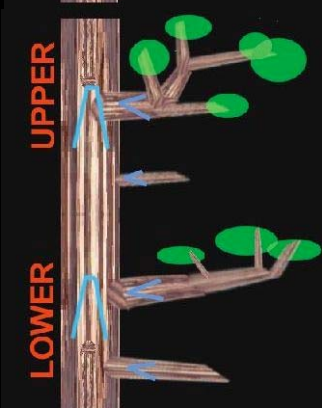
Trapping: Design



Hanging Flight intercept traps
Targeting outer crown fliers, up/low bottles
3 per tree, Upper, Mid, Low crown



Sticky traps from CD cases
Targeting inner crown fliers and jumpers
2 per tree, Upper and Lower trunk



Funnel traps
Targeting walkers and crawlers
6 per tree: trunk, live branch, dead branch for Upper and Lower crown

Trapping: Results

100 year old

Abundances

3411 total. More mites, moths, stoneflies

Old growth

2931 total. More spiders, beetles, roaches, ants, termites

Species Richness

226 total. More bug species

233 total. More fly, beetle, & wasp species

Diversity (Evenness & Richness; Simpson)

Consistently lower

Consistently higher. Strongest for beetles

Expected True Richness (Chao Estimator)

310 species expected

355 species expected

Taxonomic Overlap & Composition

More variable composition

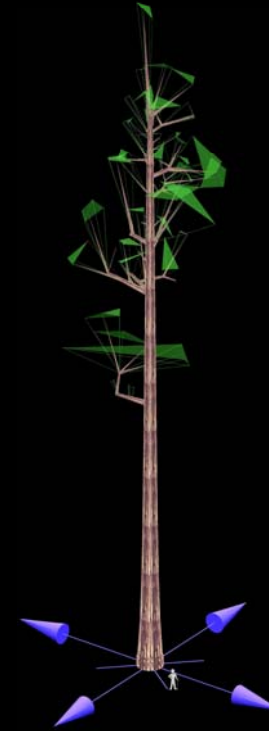


More consistent composition

Spatial changes often overshadowed systematic age related changes

Correlations: Structure-Arthropods

- At a tree level, correlations were identified between structural descriptors and arthropod summaries.
- Exploratory investigation
- Many combinations filtered through Bonferroni correction
- Correlation is not causation!



Group	(+/-)	Structural Predictor		Summary	Arthropod response
Old trees with a	higher	% of total wood volume in the trunk	<i>had a</i>	more diverse	total arthropod fauna
Trees with	less	crown depth	<i>had a</i>	richer	Dipteran fauna
Trees with a	narrower	range of dead branch starting diameters	<i>had a</i>	more diverse	sticky trap catch
Trees with a	wider	range of live branch starting diameters	<i>had a</i>	richer	hangtrap catch
Old trees with	greater	mean upwards arc	<i>had a</i>	richer	hangtrap catch
Trees with a	lower	mean branch height as % of total height	<i>had a</i>	richer	hangtrap catch

Conclusions

- The age classes were structurally distinct in several ways, including size, branch dynamics, feature presence.
- The 100y trees were not scaled-down version of the old trees. *Eucalyptus obliqua* does not appear to have old-growth structural characteristics at 100 y.
- Arthropods collected in this study were more diverse and had a higher expected richness in the old trees. .
- The fauna is more taxonomically consistent in old trees and more variable in 100 y trees.
- Geographic faunal shifts often masked a systematic age-related faunal shift.
- Correlations between structure and arthropods await future research.
- 3-d models are available for use.
- More information at www.geog.utas.edu.au/yoav or contact ydbarness@gmail.com

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