DISCUSSION

1. Summary
   1. Summarise ‘answers’ to research questions (few interactions, variable main effects, species specific)
   2. Was CO2 or waterlogging stronger as a main effect?
2. Relationships between gas exchange parameters and biomass accumulation
   1. Did higher photosynthesis translate to higher biomass? (“It is important to note that A per unit leaf area is not the most important factor for predicting overall plant growth (Korner 1991). The combination of carbohydrate produc- tion, which is determined by photosynthetic rate and leaf area, and the consumption of carbohydrates for growth, respiration, storage, and root exudation, account for most of the overall growth enhancement under conditions of eCO2 (Morison and Lawlor 1999).” – (Wang, Heckathorn, Wang, & Philpott, 2012)
   2. Did stomatal closing occur in response to flooding?
   3. Talk about WUE.
   4. Acacias didn’t have lower stomatal conductance under flooding, and photosynthesis stayed the same, but they used water more efficiently.
   5. No similar patterns between PR and gs for casuarina, and eCO2 effect on photosynth only found for WUE of waterlogged plants
   6. Euc photosynthesis improved under recovery, associated with increased stomatal conductance. WUE stayed constant between treatments and eCO2 plants maintained their advantage.
3. Biomass accumulation
   1. Acacia and euc unaffected by eCO2 (precedent?) but casuarina had the most interesting interaction effect in the study
   2. Roots? Both fine and total decreased in AF, stayed constant (although interaction) in CC, and fine but not total increased for EC (spongy white aerenchymous roots)!
   3. Flooding didn’t do much to shoots (except CC interaction).
4. Traits and economic spectra
   1. Species-specific effects, no clear pattern.
   2. AF flooding shifted traits > conservative
   3. CC CO2 shifted traits > conservative
   4. EC flooding reduced fine root DMC (more aerenchymous roots), reduced SLA (starch storage?)
5. What happened during recovery? Did plants recover?
6. Elaborate on the Casuarina interaction
   1. Is there anything we already know about CC and CO2 / flooding?
7. Evidence for anoxic drought / stomatal closure vs starch storage hypotheses

**eCO2 effect for E. camaldulensis**

<http://cyberleninka.ru/article/n/variation-in-gas-exchange-characteristics-in-clones-of-eucalyptus-s-amaldulensis-under-varying-conditions-of-co-2>

**flooding (root hypoxia) effect on E. camaldulensis**

<http://treephys.oxfordjournals.org/content/26/11/1413.short>

“ Root hypoxia caused decreases in whole-plant biomass, photosynthetic rate and stomatal conductance in E. camaldulensis, but not in M. cajuputi. “

<http://www.publish.csiro.au/?paper=PP9960497>

clonal lines of E. camaldulensis “Stomatal conductance, net gas exchange and leaf nutrient allocation did not differ greatly among the clonal lines.”

**Flooding effect on Causarina:**

Melaleuca cuticularis and C. obesa survived all treatments, and generally maintainedhigh rates of net photosynthesis. Banksia attenuata tolerated neither waterloggingnor salinity

* “Variable tolerance of wetland tree species to combined salinity and waterlogging is related to regulation of ion uptake and production of organic solutes”

Frankia requires aeration to colonise Casuarina – therefore Frankia might have been subsidising N in control treatment but died or was impaired following waterlogging.

<http://link.springer.com.simsrad.net.ocs.mq.edu.au/article/10.1007/BF02232785>

eCO2 effects on Casuarina

* None known? Ask Mel…