

Wrap Up: The Big Scale

- We have come a long way in 30 years:
 - Webb, Pearman & Leuning (1980)
 - Fraquhar, von Caemmerer & Berry (1980)
 - 344 ppm & 1.5 ppm yr⁻¹ in 1982, 397 ppm & 2 ppm yr⁻¹ now
 - But we need to state where we want to be in 30 (or even 15) years
- The emphasis on observation and modelling has reversed over the last 30 years:
 - Reverting to tested or testable hypotheses is needed
- There are large gaps between important groups:
 - Hydrologists, ecologists, biologists & atmospheric scientists
 - The problems and scales are still different
 - Policy makers and scientists
 - “Funding event horizon” is looming
- If there is a 50/50 chance of 3 C warming (MR) and MDB outflow drops by 28% at 4 C warming (VH) then Australia faces a large challenge:
 - What can we do to mitigate the problem?

Wrap Up: The Smaller Scale

- We can estimate continental Carbon and Water exchanges:
 - Large disparity between different methods but converging
 - Large uncertainties from each method but reducing
 - Large uncertainty in predicted behaviour at elevated CO₂
 - Multiple data sets to constrain models will help but will not solve
- Cross-fertilization of ideas is a powerful feature and a powerful argument for diversity in approaches:
 - Theoretical and wind tunnel studies of canopy flow
 - Optimality and maximum entropy production approaches
- We are still debating some fundamentals:
 - Stomatal response to D
 - Closure of surface energy budget
 - Root/water extraction depths
- We are unable to do some basic but practical things:
 - Colin would say we can't model C & W budgets!
 - Tom showed we can't get soil C at short time scales
 - Ian Prosser showed the need for accurate ground water recharge