Wrap Up: The Big Scale

• We have come a long way in 30 years:
  – 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 CO$_2$
  – 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