THE ROLE OF THE TERRESTRIAL BIOTA IN THE ATMOSPHERIC CARBON BUDGET:
Discussion notes for special session.

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1. INTRODUCTION

Throughout several decades of modelling of the global carbon cycle, the role of the terrestrial biota in the atmospheric carbon budget has been one of the greatest uncertainties.

There are three key questions:

- Most importantly: What will the atmospheric carbon budget be in the future?
- What is the atmospheric carbon budget now? Given the new uncertainties that have arisen about this, some resolution is needed before we can make confident predictions about the future.
- What has been the atmospheric carbon budget in the past? The history of past changes will place a number of constraints on the possible interpretations of the present atmospheric budget.

In this discussion, we will take 'the present' to refer to the period around 1980–1985 for which good quality atmospheric data have been published.

The most common units for discussing atmospheric carbon budgets are Gt C (gigatonnes of carbon). These are related to atmospheric concentration units by the factor 1 Gt C = 0.471 ppmv. The concentration increase of 1.5 ppmv y^{-1} observed over 1980–1985 thus corresponds to a rate of increase of atmospheric carbon of 3.185 Gt C y^{-1} . Rotty [1] estimated the fossil carbon releases for 1980 to 1984 as 5.255, 5.115, 5.082, 5.054 and