

Preface

The Breathing of the Earth

The terrestrial biosphere is an important component driving atmospheric CO₂ variations on seasonal as well as on interannual time scales. For instance, climatic perturbations associated with the El Niño Southern Oscillation phenomenon or volcanic eruptions like that of Mt. Pinatubo are likely to have an impact on the CO₂ exchange between terrestrial ecosystems and the atmosphere. However, net terrestrial carbon uptake due to CO₂ and nitrogen fertilization is still a major unknown of the global carbon budget and thereby of the fate of anthropogenic CO₂ emissions.

At the IUGG XXI General Assembly in Boulder, Colorado, 2–14 July 1995, a CO₂ Symposium was held with the title '*The Breathing of the Earth – Observational Constraints for Models of the Terrestrial Biosphere*'. This Symposium, co-convened by Ingeborg Levin (University of Heidelberg, Germany), Pieter Tans, (NOAA, Boulder, USA) and David Schimel (NCAR, Boulder, USA) focussed on a discussion of how to better assess the rôle of the terrestrial biosphere in the global carbon cycle through observational programs and modelling. About 40 oral and poster presentations were given during the 2-day Symposium. This special issue of *Tellus* contains a set of these presentations, covering topics from global CO₂ modelling and observational network optimization, through to a global estimate of carbon releases associated with land use changes and continental and regional scale measurements of CO₂ and its isotope ratios.

The papers in this special issue have undergone the regular Tellus review procedure.

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