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0521651999 - The Changing Ocean Carbon Cycle: A Midterm Synthesis of the Joint Global Ocean Flux Study

Edited by Roger B. Hanson, Hugh W. Ducklow and John G. Field

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The Changing Ocean Carbon Cycle

A midterm synthesis of the Joint
Global Ocean Flux Study

The world's oceans act as a reservoir, with the capacity to absorb and retain carbon dioxide. The air-sea exchange of carbon is driven by physico-chemical forces, photosynthesis and respiration, and has an important influence on atmospheric composition. Variability in the ocean carbon cycle could therefore exert significant feedback effects during conditions of climate change. The Joint Global Ocean Flux Study (JGOFS) is the first multidisciplinary programme to directly address the interactions between the biology, chemistry and physics of marine systems, with emphasis on the transport and transformations of carbon within the ocean and across its boundaries. This unique volume, written by an international panel of scientists, provides a synthesis of JGOFS science and its achievements to date. It will therefore appeal to all those seeking a recent overview of the role of ocean processes in Earth system science and their wider implications on climate change.

ROGER HANSON is the Executive Officer of the JGOFS at the International Project Office in Bergen, Norway. He was previously the Associated Program Director in Geosciences and Office of Polar Programs at the US National Science Foundation.

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INTERNATIONAL GEOSPHERE–BIOSPHERE PROGRAMME BOOK SERIES

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A midterm synthesis of the Joint Global Ocean Flux Study

Edited by

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Preface

International studies are essential to obtain global-scale understanding of ocean processes. The Joint Global Ocean Flux Study (JGOFS, jointly sponsored by the International Geosphere–Biosphere Programme, IGBP, and the Scientific Committee on Oceanic Research, SCOR) is the first international ocean project to directly address the interactions between the biology, chemistry and physics of marine systems. Its emphasis is on carbon exchange, cycling and export within the ocean and across the ocean's boundaries, with the atmosphere, the sea floor and coastal waters. The air–sea exchange of carbon is driven by physico–chemical forces, photosynthesis and respiration, and has an important influence on atmospheric composition. The temporal and spatial variability of these biogeochemical processes in the ocean carbon cycle could therefore exert significant feedback effects during conditions of climate change.

The first JGOFS Scientific Symposium held at Villefranche-sur-Mer, France, in May 1995, in which some 150 ocean scientists participated, inspired this book. The editors selected and re-structured some of the invited plenary presentations from the Symposium to provide a balanced synthesis of our understanding of ocean biogeochemistry towards the end of the twentieth century, as advanced by JGOFS since its inception.

Many organisations and people have worked together to make this publication possible. The Symposium was organised by the French National JGOFS Committee and financed under SCOR, IGBP, US National Science Foundation, the International Council of Scientific Unions (ICSU), Observatoire Oceanologique de Villefranche-sur-Mer, and several JGOFS National Committees. The Organising Committee comprised: Liliane Merlivat (Chair), Arthur C. T. Chen, Hugh Ducklow, John Field, Elizabeth Gross, Guy Jacques, André Morel, Paul Nival, Trevor Platt, Jarl-Ove Strömberg, and Neil Swanberg.

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