



CLIMATE- OCEAN INTERACTION

Edited by

M.E. Schlesinger

Kluwer Academic Publishers
North Atlantic Treaty Organization
Commission of the European Communities

Climate-Ocean Interaction

edited by

M. E. Schlesinger

Department of Atmospheric Sciences,
University of Illinois,
Urbana, Illinois, U.S.A.

279/3461 INSTITUT
FÜR METEOROLOGIE U. KLIMATOLOGIE
UNIVERSITÄT HANNOVER
HERRENHAUSER STR. 2 • 3000 HANNOVER 21



Kluwer Academic Publishers

**North Atlantic Treaty Organization
Commission of the European Communities**

Table of Contents

Preface	vii
List of Lecturers	xiii
List of Participants	xv

Part 1: Introduction

The Ocean as a Component of the Climate System	3
<i>S. J. FOREMAN</i>	

Part 2: Observations of the Climate of the Ocean

Observed Variations of Sea Surface Temperature	21
<i>C. K. FOLLAND and D. E. PARKER</i>	
Can Box Ocean Models Calibrated by Inverse Methods Provide a Means of Testing Ocean Circulation Models?	53
<i>K. J. HOLMÉN</i>	

Part 3: Modelling the Atmospheric, Oceanic and Sea Ice Components of the Climatic System

General Circulation Modelling of the Atmosphere	67
<i>J. F. B. MITCHELL</i>	
An Ocean Modelling System for Supercomputer Architectures of the 1990s	87
<i>R. M. CHERVIN and A. J. SEMTNER, JR.</i>	
Modelling Sea Ice for Climate Studies	97
<i>J.-P. VAN YPERSELE</i>	

Part 4: Simulating the Variability of Climate on Short, Medium and Long Time Scales		
Interannual Variability in Coupled Tropical Atmosphere-Ocean Models . . .	127	<i>D. S. BATTISTI</i>
Predictability of ENSO	161	<i>E. S. SARACHIK</i>
ENSO Modelling at MPI	173	<i>M. LATIF</i>
Specification and Variability of the Surface Forcing of the Ocean	193	<i>H. CATTLE and C. GORDON</i>
Ocean Models and the Inter-Basin Transport of Heat	211	<i>N. C. WELLS and C. MEAD</i>
Extratropical Response to SST Anomalies and the Barotropic Model	225	<i>T. N. PALMER</i>
Modelling of Geochemical Tracers in the Ocean	233	<i>E. MAIER-REIMER and R. BACASTOW</i>
Diapycnal Mixing	269	<i>E. B. KRAUS</i>
Climatic Change and Ocean Bottom Water Formation: Are We Missing Something?	295	<i>M. I. HOFFERT</i>
Reconstructions of Low and Middle Latitude Export Productivity, 30,000 Years BP to the Present: Implications for Global Carbon Reservoirs	319	<i>M. SARNTHEIN and K. WINN</i>
Global Estimation of Oceanic Eddy Transports from Satellite Altimetry? . . .	343	<i>G. HOLLOWAY</i>
Part 5: Working Group Reports		
1 Climate Observations	353	<i>C. K. FOLLAND</i>
2 Modelling	361	<i>R. M. CHERVIN</i>
3 ENSO Modelling and Prediction	365	<i>E. S. SARACHIK</i>
4 Climate-Ocean Interaction on Time Scales of Decades to Centuries . . .	371	<i>M. I. HOFFERT</i>
5 Impact of Paleoclimatic Proxy Data on Climate Modelling	375	<i>M. SARNTHEIN</i>
Index	379	