

# Ocean Biogeochemical Dynamics

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Lastly, Ocean Biogeochemical Dynamics is a valuable resource for instructors, who will particularly appreciate the problems listed at the end of each chapter, and for graduate students and advanced undergraduates who want to learn more about the chemistry, biology, and dynamics of oceans I commend it without reservation Michael B McElroy

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Ocean Biogeochemical Dynamics Jorge L Sarmiento and Nicolas Gruber PRINCETON UNIVERSITY PRESS | PRINCETON AND OXFORD Contents PREFACE xi Chapter 1: Introduction 1 11 Chemical Composition of the Ocean 1 12 Distribution of Chemicals in the Ocean 7 13 Chapter Conclusion and Outline of Book 15

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### **ERRATA Ocean Biogeochemical Dynamics**

Ocean Biogeochemical Dynamics Jorge L Sarmiento & Nicolas Gruber Princeton University Press 2006 Last update (1 November 2010) • Page 360, Caption of Figure 911: Change “Carbonate Budget of the global ocean” to “Budget of carbonate (alkalinity) of the global ocean” • Page 361, Figure 912: the labels “undersaturated

### **Sensitivity of global ocean biogeochemical dynamics to ...**

Sensitivity of global ocean biogeochemical dynamics to ecosystem structure in a future climate Manfredi Manizza,<sup>1,2</sup> Erik T Buitenhuis,<sup>1</sup> and Corinne Le Quéré<sup>1,3</sup> Received 23 March 2010; revised 28 May 2010; accepted 14 June 2010; published 15 July 2010 [1] Terrestrial and oceanic ecosystem components of the

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OCEAN BIOGEOCHEMICAL DYNAMICS, CHAPTER 1 ocean biogeochemical dynamics sarmiento pdf January 7, 2003 thulium, and lutetium Sep 10, 2004 Princeton University The authors of Ocean Biogeochemical Dynamics aim to provide a theoretical framework for the study of biogeochemical processes in the oceans ocean biogeochemical dynamics sarmiento

### **Impact of changing Siberian land-shelf-basin on the Arctic ...**

marine biogeochemical dynamics • The Siberian Arctic Ocean is a target area for future biogeochemical and ecological studies because the area is expected to dramatically change in biogeochemical cycles and biological production with the subsea permafrost thawing, coastal erosion, and sea ice reduction Stations of Russian vessels (2003-2010)

### **The Southern Ocean biogeochemical divide**

The Southern Ocean biogeochemical divide I Marinov<sup>1†</sup>, A Gnanadesikan<sup>2</sup>, J R Toggweiler<sup>2</sup> & J L Sarmiento<sup>1</sup> Modelling studies have demonstrated that the nutrient and carbon cycles in the Southern Ocean play a central role in setting the air-sea balance of CO<sub>2</sub> and global biological production<sup>1-8</sup>

### **Biogenic opal - MIT OpenCourseWare**

Ocean Biogeochemical Dynamics Princeton, NJ: Princeton University Press, 2006 ISBN: 9780691017075 0 0 1000 2000 3000 4000 5000 6000 7000 0 0 1000 2000 3000 4000 5000 6000 7000 10 20 30 40 50 60 70 80 90 100 10 20 30 40 50 60 70 80 90 100 Water Depth (meters) Water Depth (meters) CaCO<sub>3</sub> CaCO<sub>3</sub> Lysocline

### **Ecosystem dynamics based on plankton functional types for ...**

Ecosystem dynamics based on plankton functional types for global ocean biogeochemistry models CORINNE LE QUE´RE´\*<sup>1</sup>, SANDY P HARRISON\*<sup>w</sup>, COLIN PRENTICE\*<sup>z</sup>, ERIK T BUITENHUIS\*, OLIVIER AUMONT§, LAURENT BOPP}, HERVE´ CLAUSTREk, LETICIA COTRIM DA CUNHA\*, RICHARD GEIDER\*\*}, XAVIER GIRAUD\*<sup>2</sup>, CHRISTINE KLAAS\*<sup>ww</sup>, KAREN E ...

### **Modeling the biogeochemical dynamics of the Northern ...**

The inclusion of the benthic dynamics in the 3D biogeochemical modeling of a shallow coastal basin, such as the Northern Adriatic Sea, represents an innovative application in the field of coastal and shelf biogeochemistry, since benthic biogeochemical processes can significantly constrain the coastal

environmental dynamics

### **The Growing Human Footprint on Coastal and Open-Ocean ...**

and ocean circulation) Fig 1 Schematic of human impactson ocean biogeochemis try either directly via fluxes of material into the ocean (colored arrows) or indirectly via climate c hange and altered ocean circulation (black arrows) The gray arrows denote the interconnections among ocean biogeochemical dynamics Note that many

### **Jorge L. Sarmiento and Nicolas Gruber: Ocean ...**

ocean, including its sediments (figure 1011) The amount of CO<sub>2</sub> in the atmosphere is also small com-pared with the gross exchange fluxes between it and the ocean and terrestrial biosphere, as reflected in the short residence time of about 6 to 8 years for CO<sub>2</sub> in the atmosphere with respect to these exchange fluxes At-mospheric CO

### **Jorge L. Sarmiento and Nicolas Gruber: Ocean ...**

ments to the mean ocean We modify (112) by adding a removal term, R, in mol yr<sup>-1</sup>  $dC_{oc} / dt = \frac{1}{V_{oc}} (n_{river} C_{river} - nR)$  (1:1:6) This model is illustrated in figure 112 Given that the accumulation times we previously calculated are much shorter than the age of the ocean, it might be reason able to suppose that the ocean concentrations have

### **Dynamic biogeochemical provinces in the global ocean**

Dynamic biogeochemical provinces in the global ocean Gabriel Reygondeau,<sup>1,2,3</sup> Alan Longhurst,<sup>4</sup> Elodie Martinez,<sup>2,5</sup> Gregory Beaugrand,<sup>6</sup> David Antoine,<sup>2,7</sup> and Olivier Maury<sup>1</sup> Received 18 April 2012; revised 27 June 2013; accepted 27 August 2013; published 5 November 2013

### **Role of zooplankton dynamics for Southern Ocean ...**

Role of zooplankton dynamics for Southern Ocean phytoplankton biomass and global biogeochemical cycles Corinne Le Quéré<sup>1</sup>, Erik T Buitenhuis<sup>1</sup>, Róisín Moriarty<sup>1</sup>, Séverine Alvain<sup>2</sup>, Olivier Aumont<sup>3</sup>, Laurent Bopp<sup>4</sup>, Sophie Chollet<sup>5</sup>, Clare Enright<sup>1</sup>, Daniel J Franklin<sup>6</sup>, Richard J Geider<sup>7</sup>, Sandy P Harrison<sup>8</sup>, Andrew G Hirst<sup>9,10</sup>,