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Autore	Adey Walter H
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Nota di contenuto	FRONT COVER; DYNAMIC AQUARIA: BUILDING AND RESTORING LIVING ECOSYSTEMS; COPYRIGHT PAGE; CONTENTS; PREFACE; ACKNOWLEDGMENTS AND DEDICATION; CHAPTER 1 Introduction; The Origin of Life: Microcosm Earth; Microcosms and Mesocosms of Aquatic Ecosystems; Restoration of Damaged Ecological Systems; Summary; Taxonomic Notes; References; PART I: PHYSICAL ENVIRONMENT; CHAPTER 2 The Envelope: Physical Parameters and Energy State; Temperature; Water Motion; Tides: Simulating the Effects of Sun and Moon; References; CHAPTER 3 Substrate: The Active Role of Rock, Mud, and Sand; The Solid Earth and Life Chemical Relationships Between Rocks, Sea Water, and OrganismsThe Solid Earth, Rock, and Model Ecosystems; Sediments and Model Ecosystems; Geological Storage; References; CHAPTER 4 Water Composition: Management of Salinity, Hardness, and Evaporation; Water Structure and Characteristics; Ocean Salinity; Hardness of Fresh Waters; Water and Model Ecosystems; Algal Scrubbing and Water Composition; Marine Microcosms and Aquaria; Quality of Top-up Water; References; CHAPTER 5 The Input of Solar Energy: Lighting Requirements; Photosynthesis and Its Origin; Solar Radiation and Water

Light Absorption by Water PlantsLight Intensity and Plants; Photorespiration; Light and Model Ecosystems; Light and Physiological Considerations; Summary; References; CHAPTER 6 The Input of Organic Energy: Particulates and Feeding; Particulates, Energy Supply, and Aquatic Ecosystems; Inorganic Particulates; Organic Particulates; Humic Substance; Particulates and Aquatic Models; Biofilms; Particulate Import in Aquatic Models; Aquatic Ecosystem Restoration; References; PART II: BIOCHEMICAL ENVIRONMENT; CHAPTER 7 Metabolism: Respiration, Photosynthesis, and Biological Loading; Metabolism RespirationBacterial Metabolism; Photosynthesis; Biological Loading; References; CHAPTER 8 Organisms and Gas Exchange: Oxygen, Carbon Dioxide, pH, and Alkalinity; Oxygen Exchange; Oxygen, Model Ecosystems, and Ecosystem Restoration; Carbon Dioxide Exchange; Carbon Dioxide and Global Aquatic Restoration; Managing Carbon Dioxide and pH in Microcosms and Mesocosms; Gas Exchange and Selected Model Ecosystems; References; CHAPTER 9 The Primary Nutrients - Nitrogen, Phosphorus, and Silica: Limitation and Eutrophication; Nutrients in Natural Waters
Eutrophication and Hypereutrophication of Natural WatersNutrients and Model Ecosystems; Summary; References; CHAPTER 10 Biomineralization and Calcification: A Key to Biosphere and Ecosystem Function; The Process of Biomineralization; The Carbonate System and the Formation of Calcite and Aragonite; Halimeda: Photosynthesis-Induced Calcification; Calcification in Stony Corals; Calcification, Stony Corals, Coral Reefs, and Global Warming; Calcification in Mesocosms and Aquaria; Coral Reef Aquaria and Stony Coral Calcification; References
CHAPTER 11 Control of the Biochemical Environment: Filters, Bacteria, and the Algal Turf Scrubber

Sommario/riassunto

In its third edition, this praised book demonstrates how the living systems modeling of aquatic ecosystems for ecological, biological and physiological research, and ecosystem restoration can produce answers to very complex ecological questions. This book further offers an understanding developed in 25 years of living ecosystem modeling and discusses how this knowledge has produced methods of efficiently solving many environmental problems. Public education through this methodology is the additional key to the broader ecosystem understanding necessary to allow human society to pass through the