Prolonged seasonal drought affects most of the tropics, including vast areas presently or recently dominated by 'dry forests'. These have received scant attention although humans have used and changed them more than wet forests. This volume reviews the available information, often making contrasts with wetter forests. The world's dry forest heterogeneity of structure and function is shown regionally. In the neotropics, biogeographic patterns differ from those of wet forests, as does the spectrum of plant life forms in terms of structure, physiology, phenology and reproduction. Biomass distribution, nutrient cycling, belowground dynamics and nitrogen gas emission are reviewed. Exploitation schemes are surveyed, and examples are given of non-timber product economies. This volume aims to stimulate research leading to more conservative and productive management and will be of interest to those working in conservation, land management, forestry and wildlife-related disciplines.

SEASONALLY DRY TROPICAL FORESTS

SEASONALLY DRY TROPICAL FORESTS

Edited by

STEPHEN H. BULLOCK
Departamento de Ecología,
Centro de Investigación Científica y de Educación Superior de Ensenada,
Ensenada, Baja California, México

HAROLD A. MOONEY
Department of Biological Sciences,
Stanford University, Stanford, California, U.S.A.

and

ERNESTO MEDINA
Centro de Ecología y Ciencias Ambientales,
Instituto Venezolano de la Investigaciones Científicas,
Caracas, Venezuela

CAMBRIDGE UNIVERSITY PRESS

CAMBRIDGE UNIVERSITY PRESS
Cambridge, New York, Melbourne, Madrid, Cape Town, Singapore, São Paulo, Delhi

Cambridge University Press
The Edinburgh Building, Cambridge CB2 8RU, UK

Published in the United States of America by Cambridge University Press, New York

www.cambridge.org
Information on this title: www.cambridge.org/9780521112840

First published 1995
This digitally printed version 2009

A catalogue record for this publication is available from the British Library

Library of Congress Cataloguing in Publication data

Seasonally dry tropical forests/edited by Stephen H. Bullock. Harold A. Mooney, and
Ernesto Medina.
p. cm.
Includes indexes.
1. Forest ecology–Tropics. I. Bullock, Stephen H. II. Mooney, Harold A. III. Medina,
Ernesto.
QU936.S39 1995
581.5′2642′0913–dc20 95-13640 CIP

ISBN 978-0-521-43514-7 hardback
ISBN 978-0-521-11284-0 paperback

This book is dedicated to the memory of a marvelous colleague and friend, Alwyn H. Gentry, who inspired and challenged us with his ideas and energy and enthusiasm. His unmatched experience in all varieties of tropical forest contributed to an extraordinarily extensive impact on conservation while greatly enriching basic science.

Contents

Contributors

Luc Abbadie
Laboratoire d'Ecologie, École Normale Supérieure, 46 rue d'Ulm, 75230 Paris, France

Kansri Boonpragob
Department of Biology, Faculty of Sciences, Ramkhamhaeng University, Bangkok 10240, Thailand

Stephen H. Bullock
Departamento de Ecología, Centro de Investigación Científica y de Educación Superior de Ensenada, Apartado Postal 2732, 22800 Ensenada, Baja California, México

Robert Bye
Instituto de Biología, Universidad Nacional Autónoma de México, Apartado Postal 70-233, 04510 México, D.F., México

Gerardo Ceballos
Centro de Ecología, Universidad Nacional Autónoma de México, Apartado Postal 70-275, 04510 México, D.F., México

Elvira Cuevas
Centro de Ecología y Ciencias Ambientales, Instituto Venezolano de Investigaciones Científicas, Apartado 21827, Caracas 1020-A, Venezuela

David Dilcher
Florida Museum of Natural History, University of Florida, Gainesville, FL 32611, USA

Rodolfo Dirzo
Centro de Ecología, Universidad Nacional Autónoma de México, Apartado Postal 70-275, 04510 México, D.F., México

César A. Domínguez
Centro de Ecología, Universidad Nacional Autónoma de México, Apartado Postal 70-275, 04510 México, D.F., México

The late Alwyn H. Gentry
Formerly of Missouri Botanical Garden, St Louis, MO 63166, USA

Alan Graham
Department of Biological Sciences, Kent State University, Kent, OH 44242, USA

N. Michele Holbrook
Department of Biological Sciences, Stanford University, Stanford, CA 94305 USA

Victor J. Jaramillo
Centro de Ecología, Universidad Nacional Autónoma de México, Apartado Postal 70-275, 04510 México, D.F., México

Michel Lepage
Laboratoire d'Ecologie, École Normale Supérieure, 46 rue d'Ulm, 75230 Paris, France

Ariel E. Lugo
USDA Forest Service, International Institute of Tropical Forestry, Call Box 25000, Río Piedras, Puerto Rico 00928, USA

J. Manuel Maass
Centro de Ecología, Universidad Nacional Autónoma de México, Apartado Postal 70-275, 04510 México, D.F., México

Angelina Martínez-Yrízar
Centro de Ecología, Universidad Nacional Autónoma de México, Apartado Postal 1354, 83000 Hermosillo, Sonora, México

Pamela A. Matson
Ames Research Center, MS 239-20, National Aeronautics and Space Administration, Moffett Field, CA 94035 USA

Ernesto Medina
Centro de Ecología y Ciencias Ambientales, Instituto Venezolano de Investigaciones Científicas, Apartado 21827, Caracas 1020-A, Venezuela

Jean-Claude Menaut
Laboratoire d'Ecologie, École Normale Supérieure, 46 rue d'Ulm, 75230 Paris, France

Harold A. Mooney
Department of Biological Sciences, Stanford University, Stanford, CA 94305, USA

Peter G. Murphy
Department of Botany and Plant Pathology, Michigan State University, East Lansing, MI 48824, USA

Philip W. Rundel
Laboratory of Biomedical and Environmental Science, University of California, Los Angeles, CA 90024, USA

Everardo V. S. B. Sampaio
Departamento de Energía Nuclear, Universidade Federal de Pernambuco, Recife, Pernambuco 50730, Brazil

Robert L. Sanford, Jr
Department of Biological Sciences, University of Denver, Denver, CO 80208, USA

Peter M. Vitousek
Department of Biological Sciences, Stanford University, Stanford, CA 94305, USA

Julie L. Whitbeck
Department of Ecology, Evolution and Organismal Biology, Tulane University, New Orleans, LA 70118, USA

Acknowledgements

Most of the chapters in this volume were presented at a symposium held at the Estación de Biología Chamela, Jalisco, México. We are grateful to our hosts of the Instituto de Biología, Universidad Nacional Autónoma de México, for their gracious hospitality. Financial support was kindly provided by the Fundación Ecológica de Cuixmala, A.C., as well as by parent institutions of the participants and U.N.A.M. This book has also benefitted from the comments of Nora Martijena, Carlos Saravia-Toledo and Jane Bulleid as well as the many reviewers acknowledged in each chapter.