

ENVIRONMENTAL SCIENCE, ENGINEERING AND TECHNOLOGY

CYCLONES

FORMATION, TRIGGERS AND CONTROL

ENVIRONMENTAL SCIENCE, ENGINEERING AND TECHNOLOGY

Additional books in this series can be found on Nova's website
under the Series tab.

Additional e-books in this series can be found on Nova's website
under the e-book tab.

NATURAL DISASTER RESEARCH, PREDICTION AND MITIGATION

Additional books in this series can be found on Nova's website
under the Series tab.

Additional e-books in this series can be found on Nova's website
under the e-book tab.

ENVIRONMENTAL SCIENCE, ENGINEERING AND TECHNOLOGY

CYCLONES

FORMATION, TRIGGERS AND CONTROL

KAZUYOSHI OUCHI

AND

HIRONORI FUDEYASU

EDITORS

The logo for Nova Publishers features the word "nova" in a bold, lowercase serif font. The letter "o" is replaced by a stylized globe showing continents and oceans. To the left of the word "nova" is a decorative graphic consisting of a series of small, grey dots arranged in a semi-circular pattern, resembling a starburst or a cluster of particles. Below the word "nova" is the word "publishers" in a smaller, lowercase serif font. At the bottom of the logo is the text "New York" in an italicized serif font.

nova
publishers
New York

Copyright © 2012 by Nova Science Publishers, Inc.

All rights reserved. No part of this book may be reproduced, stored in a retrieval system or transmitted in any form or by any means: electronic, electrostatic, magnetic, tape, mechanical photocopying, recording or otherwise without the written permission of the Publisher.

For permission to use material from this book please contact us:

Telephone 631-231-7269; Fax 631-231-8175

Web Site: <http://www.novapublishers.com>

NOTICE TO THE READER

The Publisher has taken reasonable care in the preparation of this book, but makes no expressed or implied warranty of any kind and assumes no responsibility for any errors or omissions. No liability is assumed for incidental or consequential damages in connection with or arising out of information contained in this book. The Publisher shall not be liable for any special, consequential, or exemplary damages resulting, in whole or in part, from the readers' use of, or reliance upon, this material. Any parts of this book based on government reports are so indicated and copyright is claimed for those parts to the extent applicable to compilations of such works.

Independent verification should be sought for any data, advice or recommendations contained in this book. In addition, no responsibility is assumed by the publisher for any injury and/or damage to persons or property arising from any methods, products, instructions, ideas or otherwise contained in this publication.

This publication is designed to provide accurate and authoritative information with regard to the subject matter covered herein. It is sold with the clear understanding that the Publisher is not engaged in rendering legal or any other professional services. If legal or any other expert assistance is required, the services of a competent person should be sought. FROM A DECLARATION OF PARTICIPANTS JOINTLY ADOPTED BY A COMMITTEE OF THE AMERICAN BAR ASSOCIATION AND A COMMITTEE OF PUBLISHERS.

Additional color graphics may be available in the e-book version of this book.

Library of Congress Cataloging-in-Publication Data

Cyclones : formation, triggers, and control / [edited by] Kazuyoshi Oouchi and Hironori Fudeyasu.

p. cm.

Includes bibliographical references and index.

ISBN 978-1-61942-976-5 (hardcover)

1. Cyclones. I. Oouchi, Kazuyoshi. II. Fudeyasu, Hironori.

QC941.C935 2011

551.55'13--dc23

2012001049

Published by Nova Science Publishers, Inc. † New York

CONTENTS

| | | |
|------------------|--|------------|
| Preface | | vii |
| Chapter 1 | Tropical Cyclogenesis in Wind Shear: Climatological Relationships and Physical Processes <i>David S. Nolan and Michael G. McGauley</i> | 1 |
| Chapter 2 | Analysis of Tropical Cyclone Activity in the Southern Hemisphere using Observation and CGCM Simulation <i>Satoshi Iizuka and Tomonori Matsuura</i> | 37 |
| Chapter 3 | Synoptic and Climatic Aspects of Tropical Cyclogenesis in Western North Pacific <i>Tim Li</i> | 61 |
| Chapter 4 | Variability of Typhoon Tracks and Genesis Over the Western North Pacific <i>Hisayuki Kubota</i> | 95 |
| Chapter 5 | Reduction of Global Tropical Cyclone Frequency Due to Global Warming <i>Masato Sugi</i> | 115 |
| Chapter 6 | Estimation of Changes in Tropical Cyclone Intensities and Associated Precipitation Extremes Due to Anthropogenic Climate Change <i>Junichi Tsutsui</i> | 125 |
| Chapter 7 | Sensitivity of Tropical Cyclones to Large- Scale Environments in a Global Non-Hydrostatic Model with Explicit Cloud Microphysics <i>Yohei Yamada, Kazuyoshi Oouchi, Masaki Satoh, Akira T. Noda and Hirofumi Tomita</i> | 145 |
| Chapter 8 | Variability of Extratropical Cyclonic Activity in the Northern Hemisphere Associated with Global Processes in the Ocean-Atmosphere System <i>Alexander Polonsky, Mikhail Bardin and Elena Voskresenskaya</i> | 161 |

| | | |
|-------------------|---|------------|
| Chapter 9 | Tropical Cyclone Simulation in a High-Resolution Atmosphere-Ocean Coupled General Circulation Model <i>Wataru Sasaki, Jing-Jia Luo and Sebastien Masson</i> | 197 |
| Chapter 10 | Multi-Scale Dynamics of Tropical Cyclone Formations in an Equilibrium Simulation Using a Global Cloud-System Resolving Model <i>Wataru Yanase, Masaki Satoh, Shin-ichi Iga, Johnny C. L. Chan, Hironori Fudeyasu, Yuqing Wang and Kazuyoshi Oouchi</i> | 221 |
| Chapter 11 | A Prototype Quasi Real-Time Intra-Seasonal Forecasting of Tropical Convection over the Warm Pool Region: A New Challenge of Global Cloud-System-Resolving Model for a Field Campaign <i>Kazuyoshi Oouchi, Hiroshi Taniguchi, Tomoe Nasuno, Masaki Satoh, Hirofumi Tomita, Yohei Yamada, Mikiko Ikeda, Ryuichi Shirooka, Hiroyuki Yamada and Kunio Yoneyama</i> | 233 |
| Chapter 12 | Projection of Future Tropical Cyclone Characteristics Based on Statistical Model <i>Nobuhito Mori</i> | 249 |
| Index | | 271 |