

Book Review

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BOOK REVIEW



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Grebmeier, J.M. and Maslowski, W. (eds.), 2014. *The Pacific Arctic Region: Ecosystem Status and Trends in a Rapidly Changing Environment*. Dordrecht, The Netherlands: Springer, 450p. ISBN 978-94-017-8863-2. \$179 hardcover. \$139 e-book.

The editors have put together a very useful and informative text for an important ecological zone in the northern Pacific Ocean region, comprising the Bering and Chukchi shelves and eastern portion of the East Siberian shelf. The book considers various aspects of Pacific water transiting these shelves, particularly as a major driving force for the physical environment, ice extent and thickness, productivity, and carbon transport in the Amerasian Arctic. This important book brings together a diverse range of disciplines that when considered together help to better understand transitional zonations between the northern Pacific Ocean and the Arctic Ocean. Critical here is the reporting of new understanding of biophysical impacts associated with climate change. This new information is reported from the observational research community and mathematical modelers. Although there is much scientific work yet to be done, this book helps set the stage for investigation of changes in the Arctic seasonal sea-ice extent and thickness and associated ecological responses.

Descriptions of this rapidly changing environment are grouped into 12 chapters prepared by experts in the field. In addition to organizing contributions to the book, the editors, to their credit, coauthor multiple chapters. Here is a list of chapters (in bold) and coauthors that make up the volume:

- (1) **The Pacific Region: An Introduction** (J.M. Grebmeier and W. Maslowski),
- (2) **Recent and Future Changes in the Meteorology of the Pacific Arctic** (J.E. Overland, J. Wang, R.S. Pickart, and M. Wang),
- (3) **Recent Variability in Sea Ice Cover, Age, and Thickness in the Pacific Arctic Region** (K.E. Frey, J.A. Maslanik, J.C. Kinney, and W. Maslowski),
- (4) **Abrupt Climate Changes and Emerging Ice-Ocean Processes in the Pacific Arctic Region and the Bering Sea** (J. Wang, H. Eicken, Y. Yu, X. Bai, J. Zhang, H. Hu, D.-R. Wang, M. Ikeda, K. Mizobata, and J.E. Overland),
- (5) **The Large Scale Ocean Circulation and Physical Processes Controlling Pacific-Arctic Interactions** (W. Maslowski, J.C. Kinney, S.R. Okkonen, R. Osinski, A.F. Roberts, and W.J. Williams),
- (6) **Shelf-Break Exchange in the Bering, Chukchi and Beaufort Seas** (W.J. Williams, E. Shroyer, J.C. Kinney, M. Itoh, and W. Maslowski),
- (7) **On the Flow Through Bering Strait: A Synthesis of Model Results and Observations** (J.C. Kinney, W.

Maslowski, Y. Aksenov, B. de Cuevas, J. Jakacki, A. Nguyen, R. Osinski, M. Steele, R.A. Woodgate, and J. Zhang),

- (8) **Carbon Fluxes Across Boundaries in the Pacific Arctic Region in a Changing Environment** (W.-J. Cai, N.R. Bates, L. Guo, L.G. Anderson, J.T. Mathis, R. Wannikhof, D.A. Hansell, L. Chen, and I.P. Semiletov),
- (9) **Carbon Biogeochemistry of the Western Arctic: Primary Production, Carbon Export and the Controls on Ocean Acidification** (J.T. Mathis, J.M. Grebmeier, D.A. Hansell, R.R. Hopcroft, D.L. Kirchman, S.H. Lee, S.B. Moran, N.R. Bates, S. VanLaningham, J.N. Cross, and W.-J. Cai),
- (10) **Biodiversity and Biogeography of the Lower Trophic Taxa of the Pacific Arctic Region: Sensitivities to Climate Change** (R.J. Nelson, C.J. Ashjian, B.A. Bluhm, K.E. Conlan, R.R. Gradinger, J.M. Grebmeier, V.J. Hill, R.R. Hopcroft, B.P.V. Hunt, H.M. Joo, D.L. Kirchman, K.N. Kosobokova, S.H. Lee, W.K.W. Li, C. Lovejoy, M. Poulin, E. Sherr, and K.V. Young),
- (11) **Marine Fishes, Birds and Mammals as Sentinels of Ecosystem Variability and Reorganization in the Pacific Arctic Region** (S.E. Moore, E. Logerwell, L. Eisner, E.V. Farley Jr., L.A. Harwood, K. Kuletz, J. Lovvorn, J.R. Murphy, and L.T. Quakenbush), and
- (12) **Progress and Challenges in Biogeochemical Modeling of the Pacific Arctic Region** (C.J. Deal, N. Steiner, J. Christian, J.C. Kinney, K.L. Denman, S.M. Elliott, G. Gibson, M. Jin, D. Lavoie, S.H. Lee, W. Lee, W. Maslowski, J. Wang, and E. Watanabe).

Perusal of the chapter titles shows how the physical environment and processes within the various compartments and transition zones set the stage for comprehending biogeochemistry, primary production, carbon export, ocean acidification, and the nature of trophic systems. Ecosystem variability and reorganization in the Pacific Arctic region as a result of climate change are considered by teams of experts who pull the first part of the book into the later part to advantage. Although the subject matter of the volume is broken in pieces so data can be handled in an efficient manner, the volume presents a coherent picture of environmental change in this dynamic transitional environment.

The book is well illustrated, with numerous graphs, charts, tables, grayscale drawings, and color plates. Each chapter is amply referenced in the text, which is followed by a list of citations. A brief index at the end of the book will at least get the interested researcher to the right section. This is a scientific text geared to university-level researchers and academics. The publisher has prepared the volume very well, and I found nothing objectionable, either in substance or in presentation,

that would stand in the way of appreciating this as a fine piece of work. Even though there is a short introduction, a foreword might have been useful to more fully explain for the uninitiated the goals and purposes of the Pacific Arctic Group (an international consortium of scientists, agency managers, and organizations interested in scientific progress and collaboration in the Pacific Arctic region). Nevertheless, I have no quibbles with this work and in fact laud it as providing a much-

needed look into examples of climatic change in transitional Arctic environments. I therefore recommend it without reservation as a valuable scientific endeavor that belongs in research libraries and on the bookshelves of interested researchers.

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