
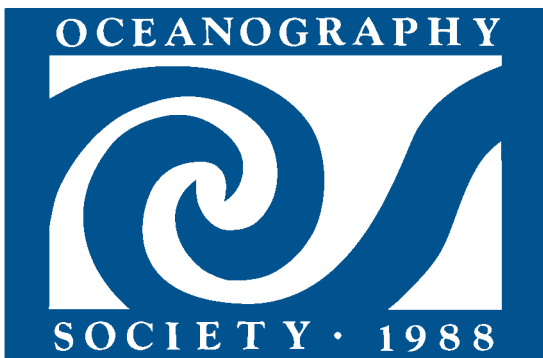


Suffice it to say that WOCE clearly represents the state of the ocean in the 1990s and that the ocean circulation has been better understood because of WOCE. The culmination of WOCE's achievement is this book, which is filled with the talents of 71 stimulating authors, who deserve the individual naming this review has given.

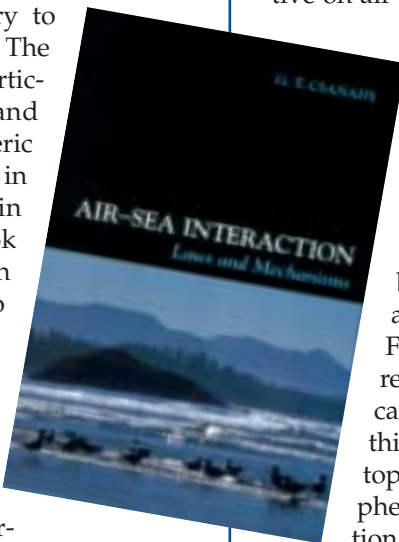
I recommend this book to those who enjoy the quest for ocean knowledge and who have enjoyed books like the *Evolution of Physical Oceanography*. Like that book, many chapters of this book individually encapsulate a knowledge of a large-scale oceanographic subject from its history to ongoing questions for future research. The book is a must for oceanographers, particularly physical oceanographers, and should be of high interest to atmospheric and climate scientists. As a teacher in both physical oceanography and in atmospheric science, I found the book very up-to-date, in its discussions on the large-scale ocean circulation. I also liked the many thought provoking questions that the authors produced along the way. I could see asking graduate students to read and discuss many of the subjects to give them an appreciation of the many ways in which our understanding of ocean circulation has come about, whether it be from a new instrument development to a new view of the ocean. Who knows? Maybe a graduate student, after reading Wunsch's perception of the views of the ocean circulation as a "multiple personality disorder", will be inspired to unite the different views of the ocean presented in this enjoyable book. 



Air-Sea Interaction: Laws and Mechanisms

By G.T. Csanady
Cambridge University Press
248 pp. ISBN 0521792592

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Gabe Csanady's 'Air-Sea Interaction: Laws and Mechanisms' provides a new and long needed perspective on air-sea interaction. This book discusses similarities and differences in the ocean and atmospheric boundary- layers, as well as the surface waves that are related to some of this interaction. Rather than focusing on one side of the interface or the other, it describes how both boundary layers act and interact on a wide range of spatial/temporal scales. The qualitative descriptions of boundary-layer processes, their evolution and forcing mechanisms are excellent. Furthermore, the writing style provokes the reader to think about these points. In some cases, atmospheric scientists are likely to find this provocation annoying: such as calling the top of the atmospheric mixed layer the 'atmospheric thermocline.' However, most of the additional thought comes easily due to the lucid and easily visualized descriptions.

Csanady provides an excellent synthesis of approaches and results. He explains or references the derivations far more thoroughly than is typical. This book a good reference despite being smaller and far more general than most other texts on air-sea interaction. The topics include descriptions of how air-sea interaction processes are linked to the evolution of related layers: the neighboring mixed layers as well as the ocean's thermocline and the inversion at the top of the atmospheric boundary. These topics are a great help in linking air-sea interaction processes to many other topics, and thereby making the topic of more interest to students whose focus is in other areas of atmospheric science and oceanography.

One of the great strengths of this book is Csanady's description of physical processes, and another is the description of interactions and balances between various processes. Plentiful illustrations enhance these descriptions. The physical mechanisms are also shown in terms of equations, which are usually well explained. One of the few difficulties with this book has to do with the numerical examples. Several colleagues who glanced at sections of the book found the numerical results to be questionable. This problem seems to stem from insufficient description of the spatial and temporal scale to which the examples apply. This flaw is relatively minor compared to the strengths of the book. 