

BOOK REVIEW

Numerical Models of Oceans and Oceanic Processes. By L. H. KANTHA & C. A. CLAYSON. Academic, 2000. 940 pp. ISBN 012 4340687. \$ 129.95

This monograph on ocean models, the latest in Academic Press's excellent International Geophysics Series, provides a comprehensive view of the present state of the field. The book will be most useful for post-graduate students and others entering the field but, primarily because of the lack of any competition, it also doubles as a useful reference book.

With 940 pages to work with the authors can afford to be inclusive. After an initial 128 page introduction to ocean dynamics, the book covers equatorial dynamics, reduced gravity models, quasi-geostrophic models, coastal models, sea-ice, tides and data processing as well as the standard sigma, level and sigma coordinate deep-ocean models. The book ends with chapters on coupled models and data assimilation, and four appendices on the equations of state, wavelets, empirical orthogonal modes and standard constants.

When reading the book, because of my own area of research I had a particular interest in seeing how well it covered the different Arakawa grids, the three main types of deep-ocean model, the theory of tides, the representation of sea-ice, isopycnal mixing and open boundary conditions. I was pleased to find that they were all included, which must be a first, and that the sections concerned were often excellent introductions to the subjects. An example is the chapter on tides. However the sections on iso-pycnal and level models were rather short and like the rest of the book tend to be US centred. The work on open boundaries, for example, does not refer to the work of Stevens and elsewhere there is little on non-US ocean models or model developments.

The book also has little on the respective merits of the different models, the effect of resolution and computer architecture on model performance or their ability to reproduce the observed structure and currents within the ocean. The continuing validity of Moore's law means that ocean models are at last becoming usefully realistic. Continuing progress will depend on a proper understanding of all these issues.

However I do not wish to be too critical. The book's virtues more than outweigh its faults and, especially for somebody entering the field, it is good value for money.

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