
Introduction to Environmental Remote Sensing

By E. C. Barrett and L. F. Curtis
Halsted Press
Chapman and Hall Limited, London,
 336 p., 1977.
 \$27.50

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This book, the most recent in the plethora of premature publications in the general area of environmental remote sensing, dramatically illustrates the folly that apparently compels authors to generate textbooks in a discipline prior to the establishment of sufficient verifiable research upon which to form an instructional base. Like recent predecessors and current counterparts, the text attempts a discussion of both the physical basis of remote sensing and the multidisciplinary applications of remotely-sensed spectro-optical data to environmental studies. Seventeen loosely connected chapters are devoted to such general areas as nature of radiative phenomena, sensor platforms and sensing devices, data collection, manual and numerical processing/analysis techniques, weather forecasting, global climatology, water, soil, mineral resources, cultivated croplands, etc. There is even a separate chapter devoted to urban studies, the purpose of which totally eludes this reviewer since the general consensus of workers in this area is that attempts to provide a cost-effective remote-sensing program to such areas has met with little more than frustration, and to mention such urban concerns as population, housing quality, family income, industrial complexes, parking lots, street planning, transportation systems, etc. in the same text as weather forecasting, basin drainage systems, crop inventories, and other fairly large-scale environmental phenomena gives a false impression of the multidisciplinary aspects of remote sensing techniques. The authors profess that their "aim has been to meet the

needs of many students, administrators and scientists . . .", but while reading this text-book, this reviewer experienced great difficulty conjuring up a readership that could really benefit from this book. The authors tend to speak in generalities and as a consequence the various topics are dealt with in a very perfunctory, and therefore, quite unsatisfactory manner. A scientifically motivated student wishing to understand the physical principles of passive and active electromagnetic radiative processes would be better referred to the wealth of excellent textbooks already in existence. By superficially overviewing a panorama of environmental disciplines, the authors have, in essence, generated a handbook of standard, by now pedestrian, activities in photogrammetry, photointerpretation and image evaluation. The book overly emphasizes the technology of remote sensing, containing, irrespective of appropriateness, an inundation of diagrams and tables, liberally taken from NASA working reports, documents, and handbooks. For example, the inclusion of the DCP encoding format in Table 6.1 is a waste of time for both the authors and the readers. Mapping is stressed, at the expense of mandatory studies of physical processes and the modelling of natural phenomena. All the standard pictures are here - Typhoon Ida, NIMBUS microwave passes of Florida and Cuba, Baffin Bay ice fields, Hurricane Fifi, ESSA polar brightness pictures, ATS down/daylight earth photos, etc. But to what purpose? An active research scientist or resource manager could read this entire text book and still not develop an appreciation for the applications of remote sensing other than the very obvious uses of standard photography (e.g., terrain, weather, and other relatively mundane "household" examples).

The premature nature of this text-book is particularly evident in the chapter on water in the environment. The authors' statements lack conviction and deal in generalities that leave a sense of frustration in a serious reader. Skylab, which scientifically has not been an exciting mission is referenced as being a valuable environmental program - praise which is at variance with the manuscripts which have resulted from the vast majority of environmental studies. The use of satellites for oil spill technology is also exaggerated and the

complexities of such applications are very noticeably underplayed.

The land areas of agriculture and forestry are dealt with in a very general, somewhat patchy, but nevertheless acceptable manner due, undoubtedly to the fact that more concentrated work has been performed in these areas, thereby providing more information upon which to base instructional discussions. However, here too an interested reader would benefit more by reading reports and monographs published by such agencies and institutions as Purdue University and the Canadian and American Departments of Agriculture and Forestry, amongst others. In fact, the now dated *Remote Sensing with Special Reference to Agriculture and Forestry* published by the National Academy of Sciences provides more insight to students, scientists, and managers alike than does this supposedly up-to-date text-book.

Undoubtedly the most informative and interesting chapters in this book are Chapters 9 and 10 devoted to weather forecasting and global climatology since meteorology is one area in which sufficient remote-sensing research and surveillance has been performed to warrant meaningful discussion. Further, this is an area in which one of the authors has contributed some excellent personal research and by referring to this work can speak with great authority. These chapters are quite delightful to read, and in this reviewer's opinion the author's work on the genetic classification of cloud systems is an obvious oasis in an otherwise barren text. There is, therefore, no doubt that the authors do have something to contribute both to furthering the advancement of remote sensing research and to the training of future workers. However, the writing of a "Pollyann-ish", superficial account of a large number of environmental disciplines (culminating in an incredibly trite closing statement) is certainly not the appropriate vehicle for their contribution. They would have been far wiser to have written a comprehensive expansion of Chapters 9 and 10 and generated a monograph in a discipline in which they display obvious comfort.

In short, there is really very little upon which to recommend this text.

MS received February 10, 1978