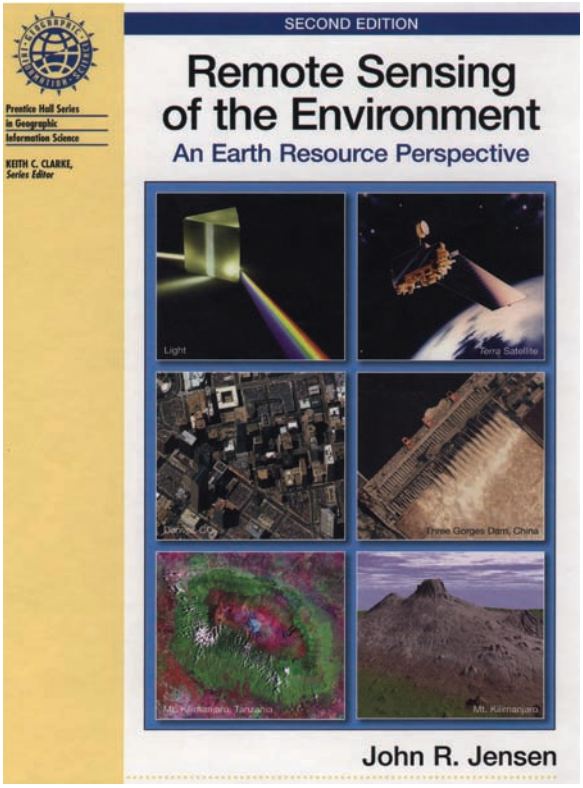
Book Review



Remote Sensing of the Environment: An Earth Resource Perspective, 2nd Edition

John R. Jensen

Prentice-Hall, Inc.: Upper Saddle River, NJ., 2007. xvi and 592 pp., diagrams, maps, photos, images, index. ISBN 0-13-188950-8.

Hardcover. $110.00

Reviewed by
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Owing to new developments in sensor technology and expanded applications of newly emerged data, remote sensing of earth resources has experienced phenomenal growth over the last few years. These new developments and applications are holistically captured in this timely book, Remote Sensing of the Environment: An Earth Resource Perspective. Written for physical, natural, and social scientists, this introductory book provides comprehensive and up-to-date coverage of the principles and applications of remote sensing for monitoring and managing earth resources.

Divided into 15 chapters, the book begins with an introduction to the major features and types of remotely sensed data. Featured prominently in this chapter is the process of remote sensing, with an emphasis on extraction of information. Discussed in chapter 2 is the nature of electromagnetic radiation. Some of the subjects require in-depth knowledge of physics and mathematics for full comprehension. Chapter 3 chronicles the evolution of aerial photography and air-borne platforms. Issues in acquisition of aerial photographs, including cameras, films, and filters, form the content of chapter 4. Chapters 5 and 6 discuss proper acquisition of qualitative and quantitative information (e.g., height, area, and length), respectively, from photographs by photo interpretation and measurement. Such advanced topics as digital generation of orthophotos are covered, whereas the purposes and applications of photo interpretation are delayed until later chapters.

The next three chapters introduce remote sensing over the visible light--near infrared, thermal infrared, and the microwave portions of the spectrum, respectively. All types of space-borne remote sensing systems, especially multispectral remote sensing, are extensively reviewed. Each of these reviews emphasizes image properties, while their interpretation and applications are defaulted until later chapters. Non-imaging microwave remote sensing, namely, lidar, is covered in a separate chapter.

Applications of remote sensing in the biosphere, the hydrosphere, the built environment, and the pedosphere are covered in the next four chapters (11, 12, 13 and 14). Each applications chapter begins with an introduction to the subject, its spectral reflectance properties, and the variables that affect a particular application. This introduction is followed by a comprehensive review of applications in every possible area in the concerned field. While the applications to vegetation are based on space-borne remote sensing, remote sensing of the built-environment is based exclusively on aerial photos. The last chapter is about in situ measurement of spectral reflectance curves.

The intended aim of this book is competently accomplished through its balanced presentation of both theory and applications. The greatest strength of this book lies in its coverage of all possible forms of remote sensing, including digital photogrammetry and non-imaging microwave remote sensing, and all possible aspects of remote sensing applications in the domain of natural resources. Theoretical narrations are lavishly augmented with ample application examples, all of which are current. These examples demonstrate how remote sensing may be applied to monitoring and managing earth resources. An extensive list of references is provided in each chapter for those readers who would like to seek further information on a given topic. The understanding of the content of the book is enhanced through numerous illustrations and diagrams, all of which are of a high standard. Discussions of certain topics are clarified through summary tables.

This book, however, could be improved in two areas. First, some important concepts could be developed more fully. For instance, the impact of various interactions of solar radiation with the atmosphere on the quality of the acquired remote sensing imagery could be

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explicitly spelled out, with the method used to minimize the impact suggested. Also, the role of ground remote sensing in all applications could be systematically elucidated in an early chapter. Secondly, the book's organization could be improved by removing repetition of image resolutions and the radiation budget, and by presenting some content more logically and coherently. The last chapter on in situ spectral measurement would be more suitably integrated with chapter 2 (nature of electromagnetic energy). The terminologies on information extraction (e.g., neural network, decision trees, and so on) could be left out as they may be too advanced for the targeted reader to comprehend.

This new edition retains the same structure as the first edition (Jensen, 2002) with two new chapters added: ground remote sensing (chapter 15) and a separate chapter on lidar remote sensing (chapter 10). The content of remote sensing applications has been updated accordingly. Similar to the previous edition, this book is written in a style that is easy to follow. This book contains a rich source of all the latest information on sensor developments and remote sensing applications in natural resources. It is highly recommended that every remote sensing specialist and practitioner, including students, acquire a copy as a reference.

References

Jensen, J. R., 2000. *Remote Sensing of the Environment: An Earth Resource Perspective*, Prentice-Hall, Inc.: Upper Saddle River, NJ., 592 pp.