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**Review of *Wetland and Environmental Applications of GIS* edited
by John G. Lyon and Jack McCarthy**

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Wetland and Environmental Applications of GIS. Edited by John G. Lyon and Jack McCarthy. Boca Raton: Lewis Publishers, 1995. 373 pp. Maps, tables, figures, glossary, references, and index. \$69.95 paper (ISBN 0-87371-897-6).

Wetlands are commonly defined as areas periodically or permanently inundated with water and typically characterized by vegetation requiring saturated soil for growth and reproduction. They have become increasingly important in environmental research as their benefits to environmental systems (wildlife habitat, flood control, for example) have become better understood. *Wetland and Environmental Applications of GIS* is an original contribution to the study of wetlands and other aquatic environments because it is the first book to address the inventory, monitoring, and management of wetlands and other surface waters by using geographic information systems (GIS), remote sensing, and computer modeling.

The volume is organized into four major sections comprised mostly of previously published articles. Part I (two chapters) provides an introduction to basic GIS concepts and a comprehensive discussion of the contribution GIS and associated technologies can render to wetland and water quality conservation. Part II (chapters 3-10), the largest section, focuses on GIS and remote sensing applications for wetland resource studies. Three of the chapters incorporate the use of analytical modeling and decision support for wetland restoration planning and the prediction of wetland community dynamics. Also included in Part II are papers on mangrove canopy reflectance, the use of archival multispectral scanner (MSS) data, and a multitemporal approach for measuring wetland change.

The five papers of Part III address environmental engineering applications related to surface waters. Topics covered informatively include pollution potential and storm water modeling and the use of GIS and GPS (global positioning system) technology to manage and coordinate maritime oil spill response. The last chapter examines the implications of aggregation and

smoothing effects on a digital elevation model (DEM). This is an important paper for anyone using DEMs or other spatially distributed data as a model parameter.

Part IV (chapters 17-22), "Additional Applications and Background," alerts the reader to a variety of data sources available to support GIS and remote sensor database production and analysis. Chapter 19 demonstrates how complex questions can be addressed by using a variety of GIS and remote sensing protocols. Chapters 20 and 21 address errors that can be associated with using GIS and offer background information for building a resource decision support system.

Providing, as it does, a detailed and intelligible summary of many aspects related to GIS and remote sensing technologies, *Wetland and Environmental Applications of GIS* is a good reference for wetland resource managers. The book also presents solid information for anyone interested in implementing a GIS or remote sensing project, together with information about GIS and remote sensing, data sources, terms, and techniques. An impressive glossary helps clarify technical terms associated with GIS and remote sensing. The volume contains articles by well-known remote sensing researchers (such as John Jensen and Kass Green, though not V. Klemas) and provides valuable information to the field. The articles are well written and enhanced by colored plates of good print quality.

Omitted from the book is an explanation of the recent hydrogeomorphic approach (HGM) for classifying wetlands now being implemented by many federal and state agencies charged with management of wetland resources. The HGM approach addresses wetland function and uses reference wetlands, GIS, and remote sensing in evaluating restoration efforts.

University GIS and remote sensing instructors, wetland resource planners, and remote sensing or GIS enthusiasts will find *Wetland and Environmental Applications of GIS* a valuable resource. Its title, however, is a bit misleading since the book emphasizes remote sensing water-oriented environments only. A more appropriate title would have been Applications of Remote Sensing and GIS for Analysis of Wetland and other Aquatic Environments. **Scott E. Richert**, *Wildlife Division, Nebraska Game and Parks Commission*.