Foreword

The demand for land-cover data spanning large areas is unprecedented. In the United States, for example, the National Biological Survey's Gap Analysis Project (GAP), the Environmental Protection Agency's Environmental Monitoring and Assessment Program (EMAP), and the U.S. Geological Survey's (USGS) National Water Quality Assessment Program (NAWQA) all require detailed land-cover information for the nation. These agencies are now working together to develop a consistent national land-cover database from Landsat TM data. At the international level, a host of conventions and treaties resulting from the 1992 United Nations Conference on Environment and Development held in Rio de Janeiro require land-cover data to address issues such as biodiversity assessment and atmospheric emissions. The U.S. Global Change Research Program, and complementary programs in many other countries, need improved land-cover data for modeling potential consequences of global climate change and evaluating human impacts on the global environment.

In recent years, the international global change research community has become quite organized and increasingly vocal in its pursuit of improved global land-cover data sets. The International Geosphere-Biosphere Programme (IGBP) Data and Information Systems (DIS) activity has provided the clearest statements concerning the specifications for new global land data sets. The Land Cover Working Group (LCWG) of IGBP-DIS has developed AVHRR processing standards for global AVHRR composites, and has assisted the USGS, NASA, NOAA, and the European Space Agency in the coordination of an effort to gather a complete set of 1-km AVHRR since April, 1992. The LCWG is now implementing a strategy to develop global land-cover data sets from the global 1-km AVHRR data.

This special issue of *Photogrammetric Engineering & Remote Sensing* focuses on recent developments in large-area land-cover characterization. While there is considerable evidence that land-cover data are required for many purposes, and literally hundreds of studies on land-cover mapping reside in the remote sensing literature, we are not yet meeting the needs of the user community, especially that portion of the community working at continental and global scales.

In their opening commentary, J. Estes and D.W. Mooney-han take issue with the myth that much of the Earth is already adequately mapped. They argue strongly for renewed and concerted efforts directed towards development of global spatial databases designed to meet contemporary requirements for land information. Progress in addressing such needs is reported by a number of investigators writing for this issue. Z. Zhu and D. Evans discuss the utility of AVHRR data for forest inventory and assessment in the U.S. Applications of AVHRR data in forest-cover mapping are given additional attention in the article by W. Ripple, who suggests means by which landscape structure can be evaluated. T. Stone *et al.* and R. Fuller *et al.* report, respectively, on recent projects to map land cover of the South American continent and Great Britain.

Other issues are dealt with as well. E. Chuvieco and M. Martin review the state-of-the-art of global fire mapping and fire danger estimation based on AVHRR observations. New and innovative methods to identify and characterize landscape change are presented by P. Chavez and D. MacKinnon. Finally, A. Moody and C. Woodcock discuss two of the most important issues to be addressed in large-area land-cover mapping — error assessment and scaling.

We believe that this collection of papers constitutes a significant contribution to the literature on large-area land-cover characterization. Thanks are extended to all of the authors who contributed manuscripts to be considered for this special publication. In addition, we thank the reviewers who generously contributed their time, energies, and expertise to help us evaluate and select the articles. Donald F. Hemenway, Jr., Executive Editor of *PE&RS*, and Jim Case, Editor-in-Chief, also provided us with critical assistance in bringing this issue to press, and we appreciate their help. We hope that this special issue of *PE&RS* will generate considerable discussion, and will stimulate additional research directed towards improvements in means to derive land-cover information for large areas.

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Guest Editors

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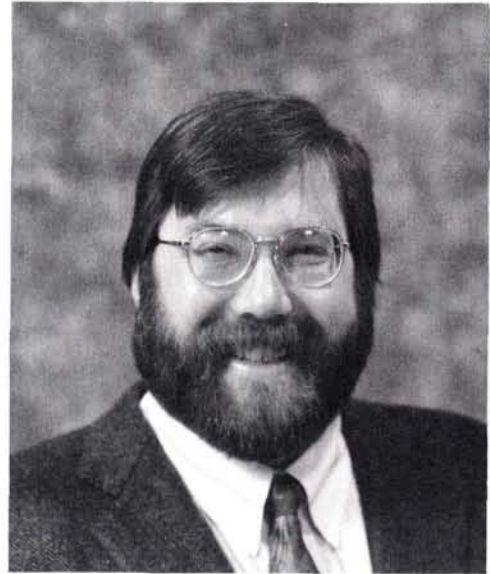
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