Foreword

It is a pleasure to present to you this special issue of *Photogrammetric Engineering & Remote Sensing* dedicated to the integration of remote sensing and GIS. Remote sensing and GIS are such companion technologies that it is sometimes difficult to talk about one without the other. They have, however, taken different paths in their development. The government sector has been dominant in the development of remote sensing, while the private sector has, in many cases, led the development of GIS. This has led to divergences in hardware, software, and education requirements. We now need to bring these technologies together. We need hardware which can do equally well in the raster and vector environments; we need software that is sufficiently sophisticated to handle multiple data types, yet is fast and easy to use; and we need an educated work force that is comprised of individuals with sufficient knowledge to "look through" the software and hardware to perform integrated analyses supporting solutions to environmental problems, rather than just "pushing buttons."

This is a rather large task. The papers presented here barely make a beginning. They are intended to spark interest and stimulate discussion. We expect disagreement. We have left many important things out. The authors and I invite your participation in a continuing dialogue through meetings, symposia, and the technical literature. Remote sensing and GIS have proceeded in parallel for nearly 30 years. It will take us a few more to bring them together.

The reader will note that these articles are the result of deliberations conducted under the auspices of the National Center for Geographic Information and Analysis. The overview paper by Star, Estes, and Davis will provide some background for the papers and will define the process used for selecting topics. In many cases, the papers resulted in collaboration among many authors. This was deliberately done to present the widest possible view. The Society and I would appreciate your feedback on the success of this approach and format.

Finally, the authors and I would like to express our gratitude to the reviewers: Ted Albert, Mike Cosintino, Tim Foresman, Steve Guptill, David Landgrebe, George Lemeshewsky, Jim Merchant, Joel Morrison, Chris Nicholas, Maurice Nyquist, Bruce Quirk, David Skole, and Jo Anne Stapleton. Their timely and thoughtful comments significantly improved each article.

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Guest Editor

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Thomas H. Mace received the B.A. degree in 1969 from Ripon College, Ripon, Wisconsin, and subsequently served five years as a U.S. Air Force Pilot. He entered graduate school at the University of Wisconsin-Madison in 1974, earning the M.S. degree in 1976 in Environmental Monitoring. He was then hired by Spectral Data Corporation as Senior Photointerpreter for the Mexican Opium Poppy Surveillance team in Culiacan, Mexico, responsible for image interpretation and cartographic operations. He returned to the University of Wisconsin-Madison in the fall of 1977, earning the Ph.D. degree in 1980, also in Environmental Monitoring. In 1980, Dr. Mace was hired by Lockheed Engineering and Management Services Company to serve on their on-site contract with the U.S. EPA's Environmental Monitoring Systems Laboratory at Las Vegas, Nevada. From 1980 to 1987, he served as Senior Scientist, Principal Scientist, Engineering Supervisor—Electronic Data Systems Laboratory, and Manager—Remote Sensing Department. He transferred to the EPA at the Laboratory in 1987 as Chief, Remote and Air Monitoring Branch, Advanced Monitoring Systems Division, responsible for EPA's research programs in remote sensing, GIS, and visibility.

In addition to publishing scientific papers in digital remote sensing applications, Dr. Mace was one of the principal champions of the use of GIS in EPA, earning two EPA Bronze Medals and the Interagency Committee on Information Resources Management Award for Administrative Excellence in the GIS implementation for EPA. He has also served ASPRS as Deputy Chairman, Hydrospheric Sciences Committee; Deputy Director and Director, Remote Sensing Applications Division; and Division Associate Editor, *Photogrammetric Engineering & Remote Sensing*. He is currently the "Environmental Monitoring Chapter" editor for the new ASPRS *Engineering and Science Series—Fundamentals of Photointerpretation*. In addition to ASPRS, he is a member of IEEE (Computer Science Society, Geoscience and Remote Sensing Society, and the Engineering Management Society) and a member of ACSM/ACA.

His current research interests are in the integration of information derived from multiple remote sensors, models, and *in situ* measurements through the use of spatial decision support systems.