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Editorial

Transactions in GIS aims to publish papers on the evolving science, technology, and application of Geographic Information Systems. Within this broad remit we recognize four major domains: the practical and theoretical issues influencing the development of GIS; generic issues related to the collection, analysis, modelling, interpretation, and display of spatial data within GIS; the connections between GIS and related technologies; and GIS applications which help to elucidate or solve problems affecting the natural, built, commercial, or social environments.

The decision to launch *Transactions in GIS* can be traced to the need for an academic journal driven by the pace and volume of change. In the past decade there has been a progressive shift in the nature of GIS from isolated research systems towards integrated global networks of geographic information. This has been parallelled by a cascading of the use of these systems from the military/research arena into government and commerce and, most recently, into the education and consumer markets. These changes have focused attention on developments in a number of areas: computer hardware, GIS software, enabling structures, common protocols, spatial data standards, and ethics. Related technologies (such as GPS, remote sensing, parallel processors, high-speed computing, and visualization tools) have achieved wider recognition for their importance to and use with GIS. Similarly, GIS is being impacted by, as well as having an impact on, developments in spatial statistics, computer-based modelling, and exploratory analysis. These developments have important consequences for the growing penetration of GIS into economic and social life. The advent of integrated GPS/GIS tools for data collection and vehicle navigation systems, and the development of distributed spatial databases accessed via browsing tools on the Internet/World Wide Web illustrate some of the ways in which such penetration is already happening.

These types of innovations will not only change the ways in which we gather and interpret spatial information but will also encourage the formation of new institutions, alliances, and standards to facilitate the distribution and sharing of tools and data. Several organizations have already been established to co-ordinate or facilitate change, and important steps have been taken to create and adopt standards for data transfers, metadata, and inter-operability. Examples of such organizations are the Association of Geographic Information (AGI) in the United Kingdom, the University Consortium of Geographic Information Science (UCGIS) and Federal Geographic Data Committee (FGDC) in the United States, and the European Umbrella Organization for Geographical Information (EUROGI).

Much of the leadership and progress with these initiatives has been contributed by scientists and engineers, and the papers in this inaugural issue exemplify their contributions and thereby continue this trend. David Rhind examines the economic, legal, and public policy issues influencing the creation, accessibility and use of GIS databases. Gary Hunter and Michael Goodchild review recent developments for tracking error and uncertainty in spatial databases.

Joseph Coughlan and Steven Running describe a new knowledge-based methodology for executing ecosystem models on large regional data sets by organizing and reducing their size prior to executing the model. Cees Wesseling and his co-workers describe a new integrated mathematical modelling language that they have developed for creating and executing dynamic environmental models inside a GIS. Robert Barr provides an international comparison of census data and their underlying geographical framework, elaborating on an important source of data for socio-economic and business applications of GIS.

These papers, when viewed as a group, illustrate the types of research and synthesis that will be required for geographic information technologies to help solve problems affecting all areas of human activity: the business world as well as the built and natural environments. Our goal in launching *Transactions in GIS* is that the journal will continue to publish such papers that provide insights on the science, technology, and applications of Geographic Information Systems, and so communicate new knowledge and assist in the education and training of the next generation of geographic information scientists.

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