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Authors

Tulloch, David L.
Epstein, Earl F.
Niemann Jr., Bernard J.
et al.

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A Community-wide Commitment to the Technology and its Ultimate
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by

David L. Tulloch ¹, Earl F. Epstein ², Bernard J. Niemann, Jr. ¹,
and Stephen J. Ventura ¹

¹ Land Information and Computer Graphics Facility
College of Agricultural and Life Sciences
University of Wisconsin -- Madison

² School of Natural Resources
College of Agriculture
The Ohio State University

An NCGIA Bibliography

Introduction

This bibliography attempts to bring together literature covering the many aspects of Multipurpose Land Information Systems (MPLIS) development. Our focus on MPLIS development comes from a concern that much of GIS adoption and diffusion research focuses on a single system within an organization instead of a network of resources within the context of a larger community. We have worked to broaden the view of MPLIS development to include the processes commonly referred to as initiation, implementation, operation and maintenance.

To reflect these issues, we have attempted to develop a bibliography that includes: (a) the concept of the community-wide value of MPLIS development and the products of these systems, (b) developmental factors and techniques, (c) studies of system status, and (d) the MPLIS development process or the adoption and diffusion of innovations and related technologies. A brief explanation of each of these topics is provided below along with specific examples from the bibliography.

Topical Explanations and Examples

Efficiency and effectiveness have been the primary objects of attention when evaluating investments in GIS/LIS (e.g., Antenucci *et al.* 1990; Dickinson and Calkins 1988; Obermeyer 1989; Onsrud 1989; Epstein and Duchesneau 1990; Smith and Tomlinson 1992; Gillespie 1994; Korte 1996; Moyer 1989; Rourk 1993). Recently, attention has turned to the benefits associated with the broader use of system products--beyond the organization and throughout the community. As a general trend, this is evidenced by the amount of research concerning community issues such as public access (e.g., Roitman 1990; Stipek and Torraca 1993) and concerns about the outcomes of the growing relationships between GIS and society (e.g., Pickles 1995; Sheppard 1995). These related outcomes have been characterized as equity (Kishor *et al.* 1990; Cowen 1994), decision making (Pinto and Onsrud 1995), and democratization (Mead 1994; Lang 1994).

As practitioners attempt to guide the development of an MPLIS, they encounter both problems and solutions. These experiences with factors affecting development have been characterized in both general project portrayals and specific efforts to isolate these technical, legal, socio-economic, and institutional factors (e.g., Portner 1982; Crosswell 1989, 1991; McRae 1989; Vastag, Thum and Niemann 1994; Ventura 1995). In the midst of this variety of research and practical literature there was an important effort to assay the literature, develop a relatively comprehensive lists of factors, and measure the perceived role played by each factor (Onsrud and Pinto 1993).

With so many communities developing systems at different rates, there has been great effort expended to measure and compare the status of some of these systems. These have included snapshot assessments of states and regions (Budic 1993; May 1994; Kuhlman 1994) as well as longitudinal studies of the expenditure and outcomes of the development process (Tulloch *et al.* 1996).

A related development has been the study of systems development as a linear process comprised of stages. This comes originally from sociology adoption and diffusion literature (Rogers 1963; Brown 1982) and has spread through the general technology literature (e.g., Churchman and Schainblatt, 1965; Raghaven and Chand 1989;

Cooper and Zmud 1990) as well as the GIS literature (Azad 1993; Aronoff 1989; Crain and MacDonald; Vastag, Thum, and Niemann 1994; with a partial summary provided by Anderson 1996).

The challenge now may be to develop a theory that weaves together these many elements. In a recent publication, Tulloch, Niemann and Epstein (1996) propose a model meant to serve that purpose. The authors hope that future research, especially with this perspective incorporated, will continue at such a rate that this bibliography can quickly be rendered obsolete.

Closing Thoughts

This bibliography is humbly offered as a helpful resource for those interested in examining MPLIS development and related topics. This is meant as neither a partisan effort -- having included the occasional contentious citation that some might prefer to not consider -- nor as a complete or final bibliography on this topic -- having made omissions by both deliberation and oversight. Of course, we would hope that future research will be such that this document will be eclipsed by a mountain of developments in this field.

Finally, we would like thank some friendly reviewers who may no longer recognize this document, but who provided some important insights concerning the potential content of early versions of this bibliography. Reviewers include Peter Crosswell, Harlan Onsrud, Joseph Ferreira, Zorica Nedovic-Budic and participants in the Mapping Science Committee's Workshop on the Future of Spatial Data and Society. We also express our appreciation to Dr. Michael Goodchild and NCGIA for showing an interest in this work and providing the support to make it a reality.

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