

# The University Consortium for Geographic Information Science

## Research Priorities



### INSTITUTIONAL GIS

#### THE PRIORITY

Knowing how and why institutions adopt and use GIS technology is critical to improving its value to society.

#### DESCRIPTION OF RESEARCH CHALLENGE

A Geographic Information Institution consists of the set of relations in a society in regard to the allocation and use of geographic information and the means to use that information.

When GIS first emerged, it was often used for short-term applications. Its adoption by agencies for use in addressing their day-to-day needs brought new problems ranging from funding to data maintenance to access issues. Quickly, the system developers found themselves less involved in preparing new code and more involved in establishing relationships, rules, standards, and budgets. The result is something often described as institutional GIS: a system (of hardware, software, rules, people, and other related elements) designed to provide continued support for a larger institution's efforts.

Institutional GIS includes a broad variety of GI Science research topics that are of critical importance to the larger research agenda of UCGIS. While it includes some of the more

traditional GIS research regarding status and implementation, it goes much further. Institutionalized GIS is required to provide sufficient support for many public resource decisions (planning, land management policies, etc.) including the incorporation of public participation into those decisions. Similarly, institutional GIS is driving much of the spatial data infrastructure research. It also includes the investigation of the benefits and costs of system implementation.

Underlying much of this work is the understanding that relationships are the glue that makes institutional GIS function. Understanding these relationships or intersections can help us with many of the remaining questions about institutional GIS.

#### IMPORTANCE OF RESEARCH CHALLENGE

This research is significant to the larger GIS research community, GIS user community, and major institutions in a number of ways. It provides a framework that helps explain and justify much of the theoretical and technical work performed by UCGIS members. Institutional GIS research is one of the major bridges that connects the GIS research community with the larger GIS community.

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The UCGIS is a non-profit organization of universities and other research institutions dedicated to advancing the understanding of geographic processes and spatial relationships through improved theory, methods, technology, and data.

## EMINENT RESEARCH QUESTIONS

What is the nature of Institutional GIS? To what degree does it already exist and how is it changing? What is causing Institutional GIS to happen and what is preventing it from happening? What are the potential benefits of Institutionalization? What kinds of relationships are at the center of this process? How can institutional GIS change the larger communities that rely on the system(s) for public resource decision making? Are there incentives that can be used to increase or improve institutional GIS? How will emerging applications, like eGovernment, impact institutional GIS?

## EXAMPLES OF POTENTIAL PROJECT AREAS

**Monitoring Status** - The existing GIS research literature includes a variety of approaches for monitoring the status of the implementation of Institutional GIS. This research could be typified by traditional surveys of GIS institutions seeking to measure the nature and extent of GIS implementation. This research could include improved monitoring of clearinghouses and data holdings as a means of creating comprehensive assessments of data availability. Certainly, this research should be conducted in a means as to contribute to a longitudinal understanding of GIS program. A key step would be the establishment of the best possible baseline data about as many systems as possible.

**Barriers and benefits** - As part of the exploration of adoption and diffusion research, a number of projects have looked at the factors that either facilitate or limit GIS implementation. An improved understanding of the reasons for system development and investment would be very beneficial to the broader GIS user community. Although this vein of research has already emerged as a strong area of study, it remains an understudied area in need of greater attention and prioritization.

**Decision making and public participation** - Much of the significance of GIS in institutions involves its incorporation into decision making processes. For public institutions this often includes public participation in determining the outcome of spatially-based

policies and individual decisions. The incorporation of the technology into existing decision processes has required new developments in areas like multiple criteria decision making.

**Spatial Data Infrastructure** - Spatial data infrastructures continue to be a major development in institutional GIS. Efforts to institutionalize SDIs at many levels demonstrate both the desire for and difficulty in building these networks. Both the NSDI and GSDI literature explore major ways in which institutions can facilitate data sharing and advanced GI development to support large projects through the use of mechanisms and techniques like clearinghouses, metadata, and standards.

**GIS History** - Much of the history of GIS revolves around significant institutional issues. Many of the technical advances in GIS can be linked to institutional issues. And many of the individual institutional GIS histories have already been captured in some way that indicates that they hold value. The role of the histories may also serve as a platform for more critical perspectives of the role that technology has played.