

Towards A Living GIS: Enhancing Digital Democracy through Sustained Citizen Participation¹

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Abstract

This paper reports on one approach to addressing a need for making information management technologies more relevant through the development of a sustainable communication network between two new governing structures: local GIS governing boards and the Maine Library of Geographic Information (MLGI). This communication network, in partnership with local comprehensive planning efforts is intended to create an innovative digital learning environment for communication and knowledge representation. One outcome will be long-term support to community-based information management efforts that link communities and state agencies through common issues. In addition, through the practical application of new GIS technology, this project will test the limits of participatory community planning models, ultimately informing and reshaping the planning process as a theoretical and methodological innovation and effective site of democracy.

Introduction

Over the decade of the 1990's Maine's coastal communities underwent a dramatic shift in their economic and demographic structure. The change was most heavily felt in the southern communities of the state as technology and service-oriented industries expanded north from Boston and outward from Portland, causing skyrocketing property values, rapid development and increased traffic congestion. North and east of this region, there remain scores of communities whose residents are dependent primarily on fishing and other waterfront related business. It is generally felt that this way of life is directly threatened by the growth and sprawl occurring to the south. On Maine's islands, these impacts are especially acute, due to these communities' finite resources².

In Maine, as in the rest of New England, there is a history of local control, and regional government is nearly non-existent. Decisions about natural resource use and community planning take place primarily at two governmental levels—municipalities and state agencies. The exchange of information between these levels of government is hindered by a number of issues, including a complex geography (Maine's undulating coastline is more than 3000 miles long), a constrained telecommunications infrastructure, limited fiscal resources, and the sheer number of municipalities, nearly all of which are small towns.

Small towns all over the country - and in much of the world - are finding themselves in the same situation (Daniels et al., 1995). If the historical and cultural roots of small towns are to be sustained in the face of globalization, we must find ways to 1) decrease the technology and information management gap between rural and urban areas; 2) protect, if not increase, social capital in small towns; and 3) address the communication barriers existing between residents with differing value systems. Harris and Wiener (1998, pg 74) envision a role for GIS in addressing these challenges, a GIS which "seek[s] to broaden the use of digital spatial data handling technologies with the objective of increasing the number and diversity of people who are capable of participating in spatial decision-making." This paper explores how citizens, non-profits, and the State are working to apply a public participation GIS (PPGIS) that echoes Harris and Wiener's approach to these challenges, in order to expand citizen participation in community planning and specifically property tax assessment processes.

Building A Citizen Driven GIS

One of the more significant recent spatial information management events along Maine's coast is the organization of two new governmental structures - the community GIS governing board and the Maine Library of Geographic Information (MLGI) Board.

These boards form the basis for a network that will involve a broad constituency in discussions and practices that address many issues including the property tax assessment process. Although the effects of geospatial technology on the outcome of local planning processes are still uncertain, it is clear that the process and products of a PPGIS are being incorporated by citizens into local planning discourse at all levels, providing new forums for participation (Ventura et al 2002).



Over the past year, the authors have worked with three Maine island communities - Vinalhaven, Islesboro, and Peaks Island - to develop a PPGIS approach (image 1). The overarching goals of this work have been to make technology more relevant to the quotidian practices of community members, concurrently building local information management capacity. The project involves a combination of classroom teaching, adult education, as well as data collection and map production applied to community-led projects.

As a vote of support for this effort each of the three island communities raised money to create public-access GIS workstations. These workstations act as repositories for spatially-referenced information, much of which has recently been gathered and formatted through comprehensive planning efforts. In addition, through the Island Institute's Fellowship Program, three recent college graduates with GIS expertise now reside in each of the three island communities and will directly support the GIS projects over the next two years. A fourth Institute Fellow provides technical and educational support to islanders from our developing Regional GIS Resource Center in Rockland.

Community GIS Governing Boards

In each of the three island communities a representative governing board has been established to deal with issues of data privacy, access, ownership, and maintenance. These governing boards, which are now in place in all three communities, are appointed by town Selectmen (except in the case of Peaks Island, which is not a municipality) and consist of community volunteers representing a broad range of local organizations and associations. The GIS governing board evolved in response to communities' desires to participate in scaled, structured discussions about geospatial information management and access, and as a strategy for addressing the important technical, legal and ethical questions associated with local GIS. The creation of these local GIS governing boards, linked together by common interests and a team of Island Institute Fellows, creates a unique opportunity for the collective exploration of the ethical and organizational challenges of managing locally generated GIS data.

Community GIS Governing Board Members



Maine Library of Geographic Information Board

Historically, the Maine Office of GIS (MEGIS) has primarily served state agency geospatial data and information management needs. Recently, the office repositioned itself to better serve the municipalities

of Maine through data management and delivery, technical support and new data development priorities. The office and its director, Dan Walters, were influential in the design and creation of the MLGI, which will act as a clearinghouse for locally-relevant data and provide small grants and technical support to municipalities for GIS data development. \$2.3 million in funding for these activities was approved by Maine voters on November 5th, 2002 through a state-wide bond.³ The MLGI is overseen by a 15 member board made up of representatives from GIS businesses, real estate associations, town and county government, universities, environmental and community development organizations and state agencies. This Board is charged with developing data standards and setting policies on data access and privacy.

The local GIS governing boards and the MLGI Board have been formed to address very similar issues, and constitute, respectively, 'bottom-up' and 'top-down' approaches to GIS management. The Island Institute will help create a formal network between the three island boards, and sponsor and facilitate communication between this local GIS network and the MLGI Board, in order that both initiatives are informed by one another and develop in a compatible manner. This linkage is particularly apropos, because the Peaks Island GIS Governing Board and the MLGI Board share a common member, Peaks resident and GIS professional Will Mitchell.

Members of the community GIS governing boards have met twice at the Island Institute for day-long meetings to share perspectives and gain new insight relative to their efforts (see photo). These meetings covered the goals of a PPGIS approach, the various potential applications of GIS at the community level, and what services the Island Institute could offer in a Regional GIS Resource Center. Between meetings, community boards conducted a GIS needs assessment and prioritized the potential applications of GIS in their community. These needs assessments⁴ will be the foundation for developing a Community GeoLibrary on each of these islands. At the most recent meeting Dan Walters presented current MLGI activities including statewide orthoimagery, parcel data development grants, and data standards creation.

Next Steps

Property assessment is an often contested local issue, one that is grounded in physical and social constraints. The physical basis for land valuation is the property's size, situation, slope, access to roads and other physical infrastructure, all things that can be easily represented and queried using GIS. Inherent in the quantitative process of assessment, however are a myriad of subjective, often aesthetic factors. At its core, assessment is an aesthetic issue and a reading of the landscape that ultimately results in a single quantitative categorization - \$350,250, \$450,000, etc. Those socially-embedded components of land valuation are at the root of much of the conflict in small communities around the nation that are facing demographic and economic change.

Despite the growing interest in land use models, and the central role GIS now plays in most of them, the search for good models of land use change to support policy making and planning remains a wild goose chase. There are no easy solutions to these problems. They all seem to derive from the fact that a range of different ontologies of processes, events and actions are implicated in any non-trivial attempt to represent land use change processes. Sorting out these different ontologies would be a first significant step towards better land use models - and better land use planning - at all scales.

We see a tremendous opportunity to explore technical and public process solutions in both of these areas, the geographic and the social, simultaneously. Because the geographic and the social aspects are not easy to sort out (and probably are inextricably linked) a basic assumption in this exploration is that the solutions, or innovations, should proceed within one frame of reference.

We are coordinating these next steps with a PPGIS effort on the west coast of North America that is developing technology to support community GIS. They describe their goal as "an ideal community GIS...that provides three windows into a dataset relevant to that community: a map viewer, a web-like hypertext viewer showing supporting information such as reports and pictures, and a visual network

browser showing the interrelations between map specific concepts, map elements, and extant scientific theory. (Harrap et al., 2001)” The researchers have developed a prototype Bowen Island Community GeoLibrary that currently realizes this functionality in the form of interactive maps created with open source generic mapping tools, a semantic network diagram created with proprietary software (ThinkMap), and a window for HTML text. The combination of these elements is based on an interpretation of pattern languages (Harrap et al., 2001).

We intend to use the Bowen Island GeoLibrary as a blueprint for sustaining local GIS efforts in the future. Overall, this is a people-centered approach to technology development, with the goal of democratizing decision making process in a dispersed geographic region that requires digital communication.

Conclusion

As is the case with many rural areas, an increasingly global real estate market has led to a pronounced escalation of property values on Maine islands, raising ethical and philosophical questions about the differences between perspectives, value sets and the meanings people attach to place. Residents of Vinalhaven, Islesboro and Peaks Island have approached the Island Institute to find ways of entering the growing debate around property taxation. At issue is the feeling among many that property value is assessed in an essentially arbitrary manner based on a generalized parcel-to-parcel comparison and crude consideration of the qualities of property that give it ‘value’. Since many of these qualities, such as view, isolation, and potential for development, are aesthetic in nature, they resist the quantification which is central to property assessment. Hence, there is a need to support local assessors by integrating traditional property characteristics with community-based values to specify appropriate assessment models.

Working closely with the assessors of these communities, experts and state officials, the Island Institute is designing a process whereby the multitude of values related to property will be weighted by community consensus at a series of public meetings using the Community GeoLibrary. The purpose of this process will be to include all relevant property value features into an assessment model that provides more suitable estimates of economic (market) value. It is our experience that the differences between values are extremely difficult to articulate.

This public participation land valuation exercise is one example of how a digital information environment like a Community GeoLibrary, as a tool for visualization and alternative methods of information representation, can be used not to replace public person-to-person decision making, but rather enhance it. Other important Maine issues which demand such an approach include aquaculture siting, growth management planning, historical preservation, commercial zoning, public works projects, and harbor or other public trust resource uses.

Notes

¹ Our community-integrated GIS work is currently part of two projects funded by the NSF. The first project is limited to the island of Islesboro and involves support for a number of town committees whose foci range from shellfish harvesting to groundwater monitoring to harbor management. Our technical support has taken many forms in this project, including attendance at community meetings, GIS data development, formal and informal GIS training, and community presentations. As described in Step 1 above, the results of our Islesboro project and the initial feedback gained during the follow-on project (which expanded the work to Vinalhaven and Peaks Island), led us to an approach that combines community public process with innovative technologies.

² These issues were discussed at length at “The Affordable Coast,” a meeting of residents from 20 island and coastal communities hosted by the Island Institute Oct. 25-26, 2002.

³ This funding was included in the \$24,100,000 environmental bond package with the following language:

-- The sum of \$2,300,000 to acquire the technology and services required to establish an Internet-based Maine public library of geographic data, to improve citizens' access to public geographic data, to make grants to municipalities for voluntary automation of parcel and zoning maps to uniform standards, to provide the state match for at least \$1,600,000 in federal funds and to participate in intergovernmental data development agreements

⁴ Examples of community GIS needs that have emerged so far are road maintenance, mooring registration and harbor planning, well-monitoring, etc.

References Cited:

Daniels, T.L., J.W. Keller, and M.B. Lapping. The Small Town Planning Handbook. Washington: APA Press, 1995.

Harrap, R, et al. Discovering the Community of Our Future: Decision Support and Digital Library Tools Supporting Informed Community Decision Making in the Georgia Basin Region. 2001. Queens University. Available: www.gis.queens.ca/research/semantics/docs/comgis.pdf. 11/01/02 2002.

Harris, T.M., and D. Weiner. "Empowerment, Marginalization and 'Community-Integrated' GIS." Cartography and Geographic Information Systems 25.2 (1998): 67-76.

Journey, M. The Bowen Island Geolibrary (V1.0) [Cd-Rom]. 2001. Bowen Island Forest and Water Management Society, Bowen Island, BC.

Ventura, Steven J., et al. "Gis-Enhanced Land-Use Planning." Community Participation and Geographic Information Systems. Eds. William J. Craig, T.M. Harris and D. Weiner. London: Taylor and Francis, 2002.