Extended Abstract, Golding.

This project began as an attempt to map future landuse scenarios in Vilas County, Wisconsin as part of the National Science Foundations Long Term Ecological Research Initiative. It was anticipated that maps depicting patterns of future development would be of great use to natural scientists in refining models of long-term ecological change. Recognizing that the ultimate development trajectory to unfold in Vilas County will be a product of local landuse planning initiatives, it was decided that my mapping efforts should proceed as a collaborative endeavor with as many local partners as possible. This is particularly important in Wisconsin, where planning remains a topic mired in local political battles throughout the states rural areas.

Because development does not occur uniformly in all types of communities, Vilas County and other rural recreation counties cannot rely on standard projection methods for predicting the spatial dimensions of their future demand for land. They differ from Midwestern prairie towns, cities and suburban rings. With the exception of several hundred wetland cranberry bogs, Vilas County sustains little or no agriculture. Most of the county is covered by forest or water, and located well-beyond commuting distance for major metropolitan areas. It enjoys abundant recreational opportunities and environmental factors that provide for a high quality of life. Therefore, the development pressures on Vilas County are distinct from the pressures felt by suburbanizing agricultural communities on the spatial interface of urban and rural.

Settlement patterns resulting from these pressures follows patterns yet to be fully explored in the use of planning support software. Unlike a county experiencing encroachment from an adjacent metropolitan area or growth from the expansion of a specific industrial sector, rural recreation counties experience growth from the demand for seasonal homes and tourist

infrastructure. Consequently, the demand for residential development experienced by Vilas County is not an effective proxy for estimating population growth. Development is probably more closely linked with demographic trends experienced in nearby metropolitan areas. Although some degree of year-round population growth certainly results from seasonal migration, the magnitude and temporal scale of that relationship remain unclear.

Thus, population change in Vilas County has remained an elusive concept to capture in projections. As new home construction booms in Vilas County, population growth is expected to either remain relatively stable, or potentially decline. For the purpose of predicting the consumption of land, therefore, estimates are based on the county's recent trajectory of new home construction and the conversion of seasonal homes to year round residences. In trying to make accurate projections of future landuse in Vilas County, it is crucial to recognize that these trends are closely linked to, national and regional economic forces that compel visitors to build vacation homes, as well the settlement preferences compelling second home owners to become permanent residents.

In addition to these conceptual complications, the process of making landuse projections in rural areas appears to be impeded by technical, financial, and political elements. First, GIS requires extensive computing capabilities, and even with What If?'s recommended system requirements, several layers of data at the county level require data processing that can span multiple days. The high number of lakes and wetlands, soil types, and conservation boundaries made Vilas County a particularly difficult area to prepare for scenario building in What If?. The county's landscape, with its thousands of lakes and vast but segmented expanses of protected forestland create scattered and awkwardly shaped parcels open for development. Given the computing time associated with

geographic data processing - a result of the large file sizes exhibited by most countywide spatial data layers - What-If? planning support software appears best suited to small municipalities or counties with homogenous topographical features and few existing land-use regulations. In my experimentation, I have reduced the scale at which the program is implemented to the frame of the individual town.

Several other characteristics of Vilas County make it a difficult case to map using PSS. The premium placed on lakefront properties for several decades has yielded unique growth patterns that are difficult to characterize using computer software. Some lakeshores have been fragmented into numerous subdivided lots while others have been protected. In recognition of this, Vilas County's shoreline zoning ordinance places specific restrictions on shoreline development and comprises an additional set of factors that should be incorporated into projections of future landuse. Further, it's lake classification system differentiates the level of protection for each lake based on where it falls in a matrix for differentiating its level of development and its potential of threat from other additional level. While the lakes add a degree of complexity to modeling landuse change, knowing which lakes will be most protected helps to better program the software to project a spatial pattern of growth that more accurately reflects the most likely development scenario.

A second and related element is a lack of financial capacity. While more governments, academic disciplines and business ventures discover the benefits of GIS, the software remains unaffordable for purchase and technical support. As with other technology, the high costs of software packages and related training restrict the use of GIS to those with the resources to invest in it.

Until very recently, planning support software had yet to be available at prices conducive to

wide scale use by small communities and rural areas. Even still, geographic data must be both available and relatively uniform for use in planning applications. Some communities have yet to see spatial data become readily available for their use. Where spatial data does exist, individual users might find the costs of procuring it to be limiting. Counties that have paid to convert their land information systems to GIS often seek to recoup the high costs of the transition to GIS-based land record systems. Furthermore, GIS support staff becomes necessary to complete data preparation and scenario building tasks. The high costs associated with the application of PSS make it less viable for rural communities and smaller forms of government than urban settings and county governments.

Finally, community-based application of planning support software is vexed by civic disquiet concerning issues of rual growth. Planning in Vilas County is crucial for ecological conservation and the protection of water resources, but as interviews have revealed, planning has been received very poorly among the public. As a tool for visualizing the consequences of a business-as-usual approach to development, Planning Support Software has the potential to make a significant contribution to planning in such scenarios. However, in order for PSS to be adopted successfully in planning processes, some communities must address hostile public sentiment toward technology.

State and federal governments have undertaken multiple mapping projects covering a wide swath of the nation. In areas where GIS remains unfamiliar to local citizens, such projects have been assailed for their inattention to local topographic nuances or construed as surveillance tactics for government schemes. This suspicion of and potential resistance to the use of GIS underscores the importance of building grassroots support for the technology in marginalized communities.

Though researchers have cataloged a long list of benefits associated with GIS technology in participatory decision-making, those benefits will be difficult to achieve where the public is unfamiliar or even suspicious of the technology.