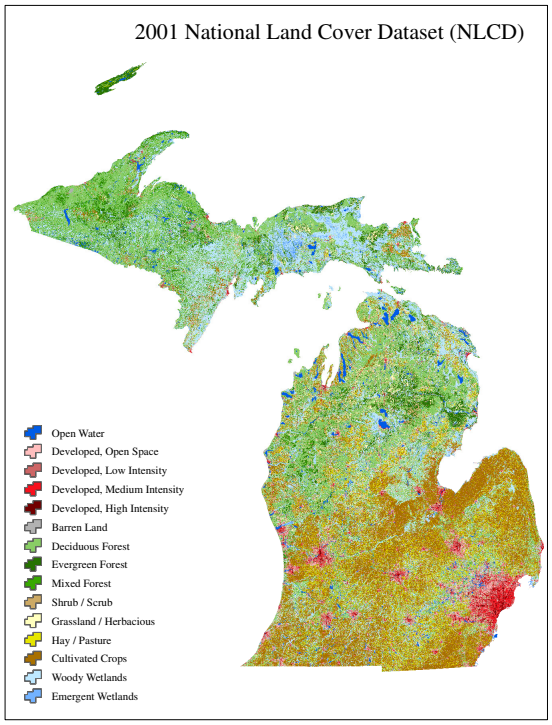
Picture Michigan Tomorrow Web Tools and Information Resources

What is driving land use change?

Introduction

Virtually all the great questions of our time involve land. I rank the following near the top. Can we reduce the number of mushrooming mega-cities, environmental refugees, and regional wars? As human linkages to the land are severed, can we discover a way to rewrap humans and nature? Can biodiversity be protected? What is lost when civilization converts the soft curves of nature to the hard lines of geometry? Can we shift our attention from the local site or ecosystem to the whole landscape or region soon enough to reverse cascading degradation? Since space on the planet is finite and few will be global managers, is regional decision-making the key to global protection? Is there a way to accelerate sustainable thinking at the time scale of human generations. All wise answers have roots in landscape and regional ecology. (Forman, 1995)

Picture Michigan Tomorrow (PMT) and the Land Policy Institute (LPI) at Michigan State University (MSU) are working to help communities make decisions that will bring New Economy businesses and jobs to the state, and create quality places to live. New Economy businesses are often at the cutting edge of technology, with many involving services.

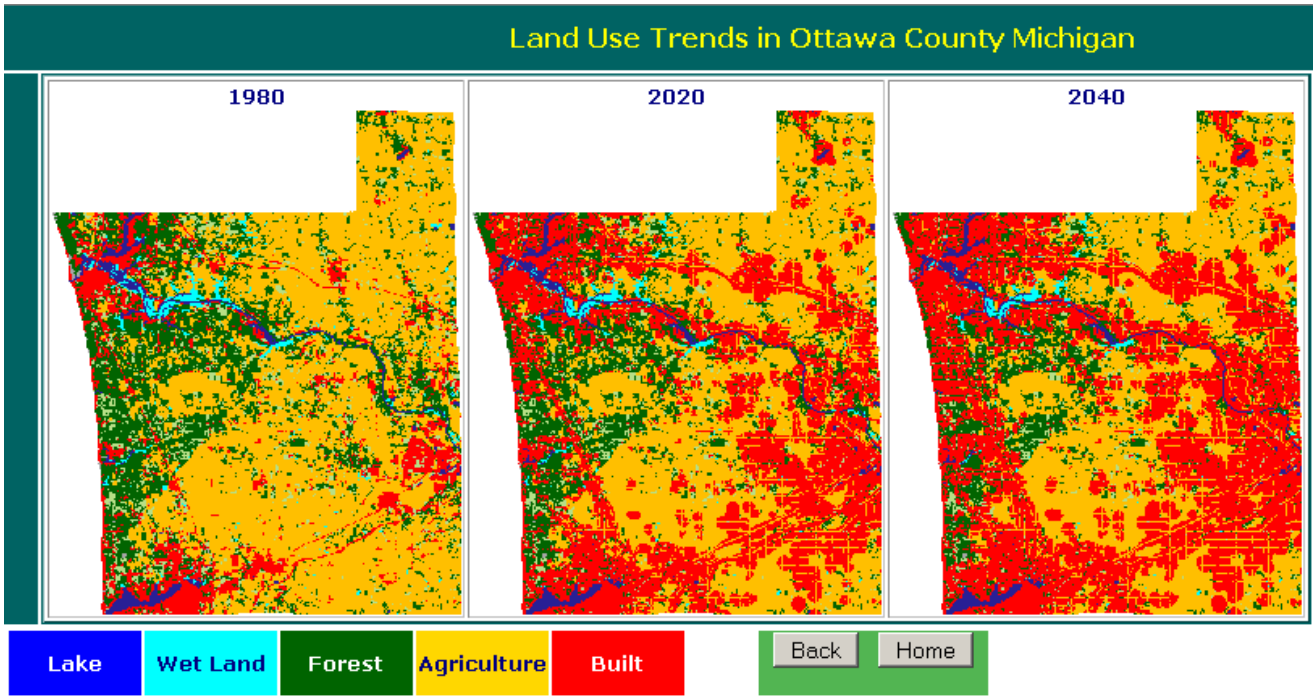


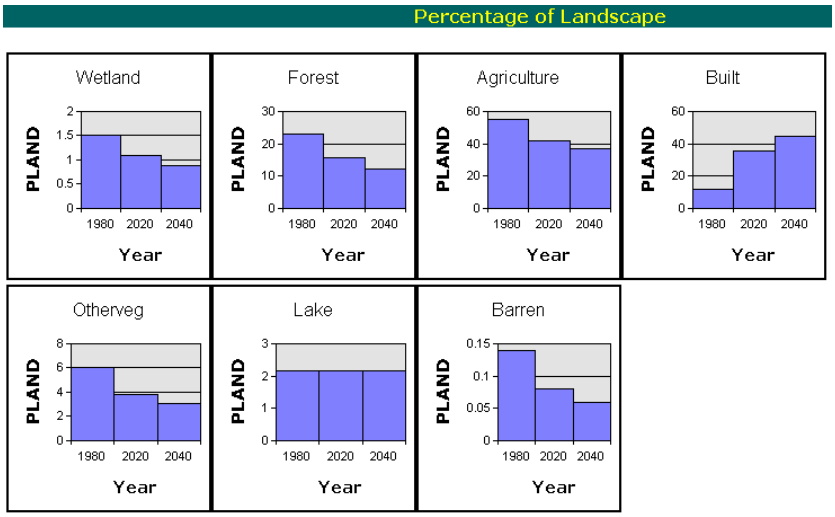
PMT has created a series of web tools to inform the decision-making process at the community and state level, and to help communities better understand their current and future land use as well as the drivers of land use change. Better understanding the dynamics and influences that cause land use change in a community can lead to better land use decisions.

Among the distinct web-based tools PMT has created is the *Michigan Tipping Point* website, which provides a county-level picture of how land use change effects industry and the ecosystem. The second tool is the *Michigan Landscape Fragmentation* website which houses information on Michigan's changing landscape and tracks its fragmentation through time. Factors that impact land use and land cover, such as social and economic factors, are included but are not part of a model that predicts future land us.

With numerous variables integrated into the PMT framework, the *PMT Community Land Use Change Drivers* map server, the third tool, allows users to access valuable information about their community and other communities in the state. Users can lookup information on their community and can find out which factors are used in the PMT framework.

Tipping Point Analysis and Projection

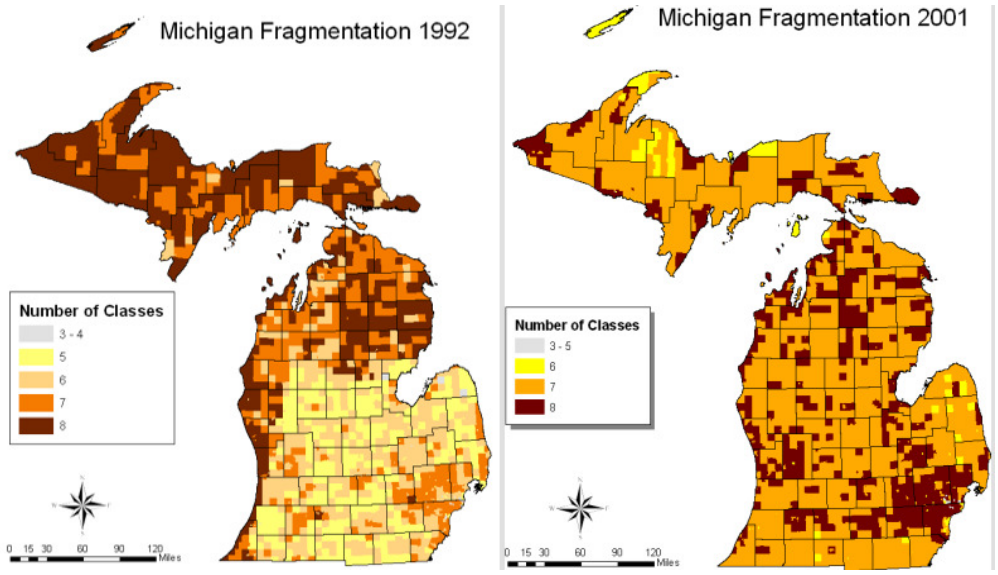


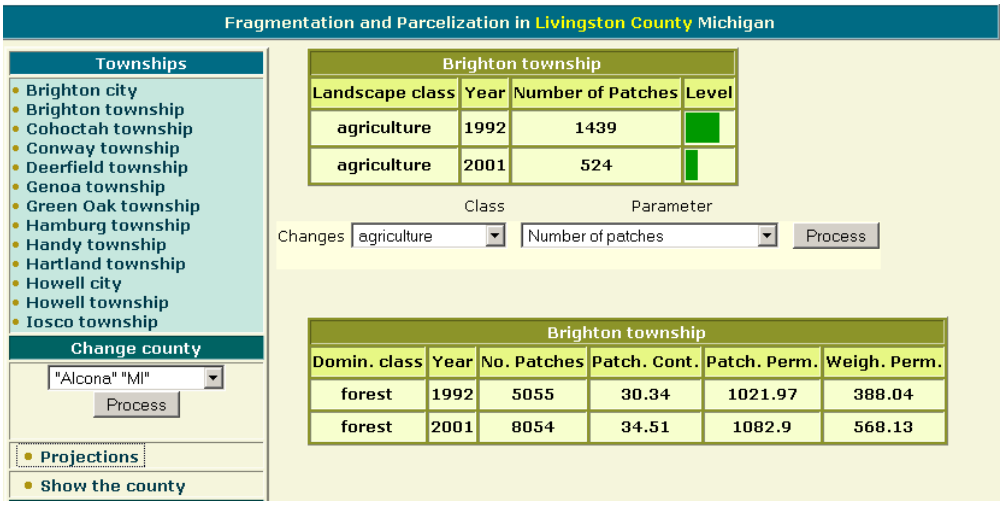


As Michigan's land base continues its transition from a natural resource based economy to a built economy the state will face many predictable as well as many unanticipated consequences. Some of these will directly impact the land based industries sectors (Agriculture, Tourism and Forestry) and others will impact the ecosystem structure and function upon which these industries are founded. A remarkable finding of a recent study, coordinated and facilitated by Public Sector Consultants (2001) on behalf of the W.K. Kellogg Foundation and the Frey Foundation, projected that by 2040 the built land use would increase by 178 percent at the expense of other major land use classes in Michigan (four million acres of land transitioned from agriculture, forestry, tourism, wetlands) with the greatest amount shifting from agriculture and private forestland. Direct losses of revenue to these economic sectors will be substantial as regions make the transition over time. The indirect losses will have more subtle consequences but may impair Michigan's ecological infrastructure to a significant extent such that Michigan will lose its position of prominence as a state with an economy based on its natural resources. The Tipping Point web page provides county level maps and trends of Michigan's changing landscape to evaluate the inflection point where the transformation from one land use state to another results in a transition of an industry or ecosystem from one system state to another.

Driving Factors Associated with Fragmentation and Parcelization in a Developing Michigan Landscape

Extensive forest and agricultural lands are under increasing pressure from development. Populations are increasing, and parcel sizes are diminishing. These trends may greatly influence our ability to sustainably support employment in extractive, forest products and agricultural industries and may adversely affect or fragment landscape-level biological diversity—especially landscape-level ecosystem structure and processes. This project will examine driving factors associated with landscape fragmentation at the county and minor civil division (MCD) level for the entire state. A case study, focusing on parcelization and fragmentation, will be completed for the developing area between Grand Rapids and Cadillac. The nine-county study area (Lake, Manistee, Mason, Missaukee, Muskegon, Newaygo, Oceana, Osceola, and Wexford counties) covers 3.3 million acres. Projections of land cover/use change for agriculture, forest, the built environment, barrens, forest, lake, wetlands, and other vegetation have been made in Michigan, but the social, economic, institutional and ecological factors driving those changes have not been incorporated into a quantitative model. The primary goal of this research is to determine the factors that have contributed to change from 1980 to 2000. MIRIS and IFMAP land cover/use classification data, census data, plat maps, and interviews with local stakeholders will be principal data and information sources for the analysis. The MIRIS and IFMAP data sets provide land cover/use classifications for the entire state and the nine-county study area for 1980 and 2000, respectively.





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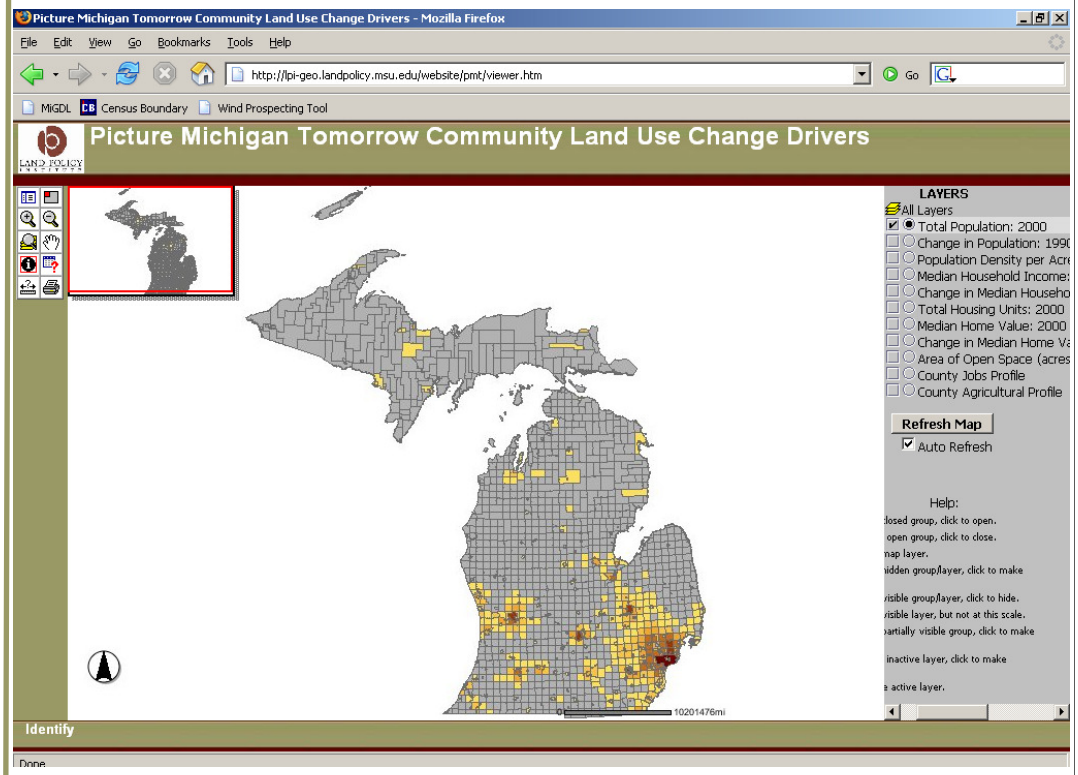
Picture Michigan Tomorrow land Use Change Drivers Interactive Map Server



Access to information is key in assisting local and state decision makers. One of the goals of PMT is to provide top quality information and resources in a format that is accessible and valuable. Understanding the information being presented allows for more informed decision making.

The *PMT Community Land Use Change Drivers* website presents a statewide view of some of the key variables that impact land use change. Users can visually see various information at the community level on a statewide view. Users can also bring up reports on specific communities and find which variables can be used to predict the communities future land use. Information gathered for the PMT framework and presented in the reports includes the social, economic, and environmental drivers within the states' communities. The information can help communities better understand the possible outcomes of alternative courses of action, hence allowing for more informed decision making.

To access the websites found in this document go to:
http://www.pmt.msu.edu/projects.html

References

Forman, R. T. (1995). *Land Mosaics: The ecology of landscapes and regions*. New York, NY: Cambridge University Press.