

# Mapping Wisconsin's Economic History

## The Bordner Survey

The impacts of the Great Depression in rural Wisconsin were amplified by the land use decisions made decades before. In northern Wisconsin most forested land had been cut, and attempts to farm this land often met with failure. By the 1920s, in some northern counties, as much as a quarter of all land could not produce enough income by farming or forestry to cover property taxes.<sup>1</sup>

Remediation efforts required accurate information about land use and land suitability for agriculture and forestry. As early as 1927, representatives of Wisconsin state government and the University of Wisconsin agreed to collaborate on a detailed land inventory of northern Wisconsin. The effort was led by John Bordner, a Wisconsin farmer who earned a PhD in plant physiology in 1908. Bayfield was the first county completed by the "Bordner Survey" (technically the Wisconsin Land Economic Inventory). By the mid-

1940s, all counties except Milwaukee had been surveyed.

The survey's level of detail was unparalleled. Field workers crossed the state at half-mile intervals, creating hand-drawn maps. These maps were later combined with air photo information to produce a composite map for each six-mile by six-mile township.<sup>2</sup> The maps depicted agricultural and forest cover,

including the types of crops grown, and the species, density, and diameter of trees. Cultural features were also recorded, including abandoned and inhabited buildings, improved and unimproved roads, telephone lines, schools, churches, sawmills, logging camps, mines, and cemeteries, to name a few. Physical features such as lakes, rivers, wetlands, beaches and shoals were also

compiled. Today these maps provide a detailed inventory of the physical and cultural landscape of the state at a time of significant change.

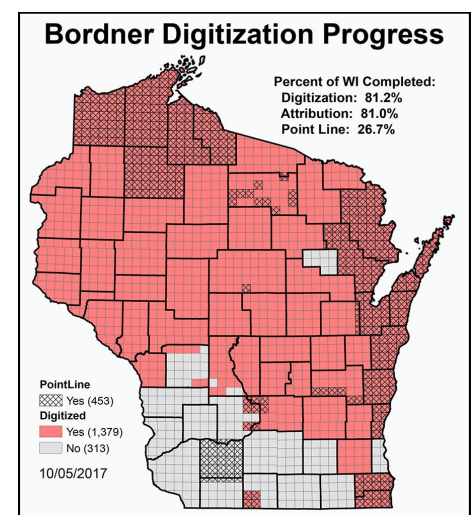
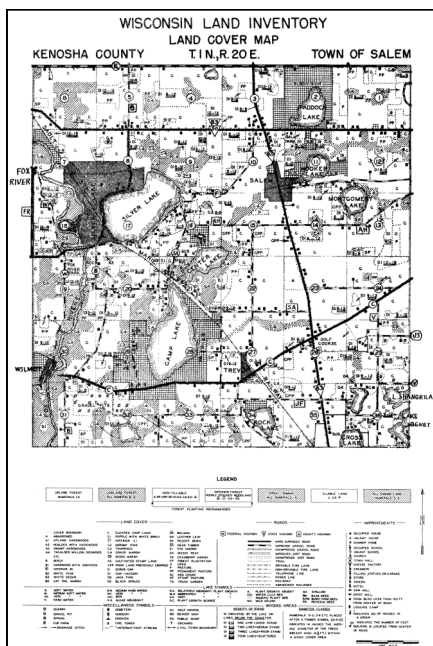
In the public policy realm, the survey's impacts were significant. In 1929 the Wisconsin Legislature passed a statewide Zoning Enabling Law to guide land use decisions in rural areas, and in 1933 Oneida County became the first county in the nation to have a comprehensive rural zoning ordinance, which created a forestry district where new agricultural development was prohibited.<sup>1</sup>

## Digitizing the Bordner Maps

The original paper maps from the Bordner Survey have been archived at the Wisconsin Historical Society. The maps have also been scanned by the University of Wisconsin Digital Collections Center and are available online.<sup>3</sup> However, paper maps and scanned images cannot easily be used in a digital environment to perform analysis or produce custom visualizations. To enable these capabilities, the maps must be digitized using GIS (Geographic Information Systems) software.

At the University of Wisconsin-Madison, the Forest Ecosystem and Landscape Ecology Lab in the

Department of Forest and Landscape Ecology<sup>4</sup> has been working for several years on this digitizing effort. For this work the Lab has received funding from the UW-Madison Graduate School, the UW-Madison College of Agricultural and Life Sciences, Wisconsin Alumni Research Foundation Research Fund, and the Wisconsin Alumni Research Foundation Kellett Mid-Career Faculty Award.



Recently the State Cartographer's Office, part of the Geography Department at UW-Madison, joined the project.<sup>5</sup> In 2016 the team received a grant from NOAA through Wisconsin's Coastal Management Program to develop a coastal Bordner map database and geoportal for the coastal zones of Lakes Superior and Michigan.

Under this grant, Bordner maps were digitized for the Great Lakes watershed and digital mosaics of 1930s aerial photography were created for coastal counties as a companion dataset for the Bordner maps. A custom online mapping application, the "Coastal Bordner Survey Explorer," was also developed to support

visualization and mapping of Bordner data for coastal areas. The application includes interactive capabilities to explore point, line and polygon features from the Bordner maps, and

provides a link to a download site for complete dataset access. Data is available in an industry-standard GIS format for any GIS user.

User guide documents are included as part of the online application. Through an info button and a project web page, information is provided about the history of the Bordner Survey, the methods used to create the original hand drawn maps, map label descriptions and interpretations, and other resources.

## Future Goals

The project team continues to work toward the goal of completing the Bordner digitizing effort for the state and providing enhanced digital access to Bordner and other historic GIS data for Wisconsin. Completing the Bordner project will dramatically extend the benefits of this dataset by making it available online to citizens, state agencies, the private and non-profit sectors, and educators and researchers.

For example, forest ecologists could use the data to analyze the severity and extent of severe forest disturbance changes, including logging and subsequent wide-spread fires. This would allow researchers to assess how such events altered forests from the original forest to post-disturbance forest to the present. This is just one

example of how the data might be used to explore historical, sociological and ecological questions.

Even greater benefits can be obtained by leveraging other historical GIS data for Wisconsin in conjunction with the digitized Bordner maps. Our vision is a statewide historical geodata portal that allows users to access and visualize a host of historic databases. We believe that Wisconsin is positioned to be a leader in the delivery of digital historic geodata due to the uniqueness of resources such as the Bordner Survey, and the work that has already been conducted to make these resources available online and formatted in ways that make them useful for analysis and visualization.

## Resources

Coastal Bordner Survey Explorer application:  
[maps.sco.wisc.edu/BordnerCoastal](https://maps.sco.wisc.edu/BordnerCoastal)

User guide documents and data download:  
[maps.sco.wisc.edu/BordnerCoastal/about](https://maps.sco.wisc.edu/BordnerCoastal/about)

## Sources Cited

1. John Koch, Touching Every Forty, Wisconsin Magazine of History, 2006.
2. <https://www.library.wisc.edu/steenbock/wisconsin-land-economic-inventory-the-bordner-survey-land-cover-maps>
3. <http://digital.library.wisc.edu/1711.dl/EcoNatRes.WILandInv>
4. <http://labs.russell.wisc.edu/landscape>
5. <http://www.sco.wisc.edu>

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