Wisconsin Historic Landscape Project

2015 Community Forum Report

Background and Purpose of the Forums

Image source: A. E. Murlin, US Geological Survey

Between 1832 and 1866 the US General Land Office (GLO) surveyed the land area that would become Wisconsin. Surveyors divided the landscape into a grid of townships and sections that define the Public Land Survey System (PLSS) while documenting information about soils, vegetation, cultural features, and wetlands.

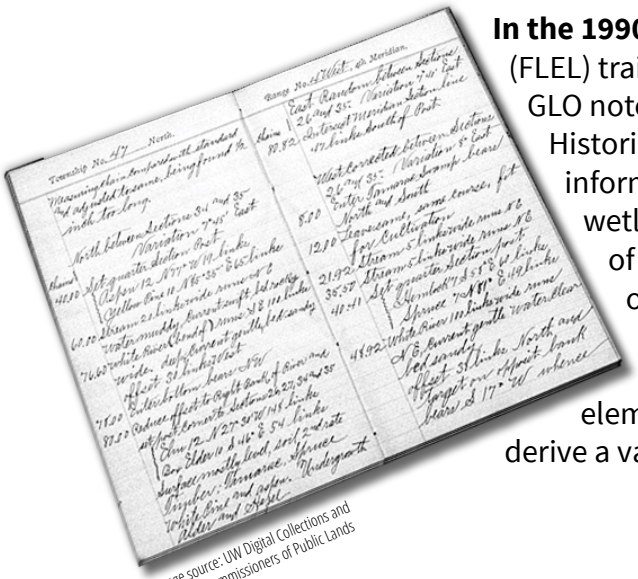
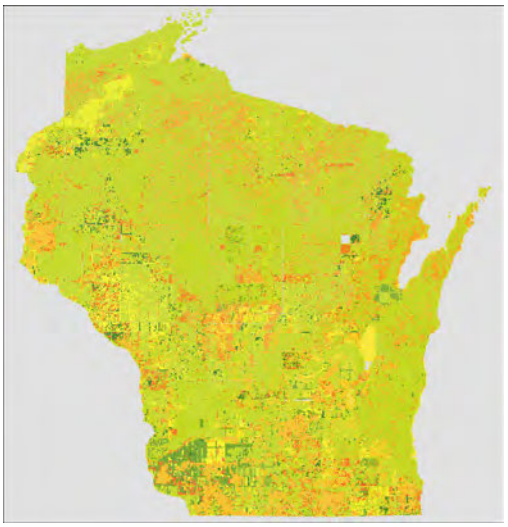


Image source: UW Digital Collections and Board of Commissioners of Public Lands

In the 1990s the UW-Madison Forest Landscape Ecology Lab (FLEL) trained a team of students to transcribe the handwritten GLO notes into a tabular database. The resulting Wisconsin Historic Landscape Database includes detailed historical information about the state's ecosystems – prairies, savannas, wetlands, original forests – through data on size and species of trees; observations about soils and vegetation; and notes on features such as timber areas, ore outcroppings, and general suitability of the countryside. The database also includes historical cultural features. All of these data elements are linked to the PLSS, making it possible to derive a variety of maps from local to statewide.



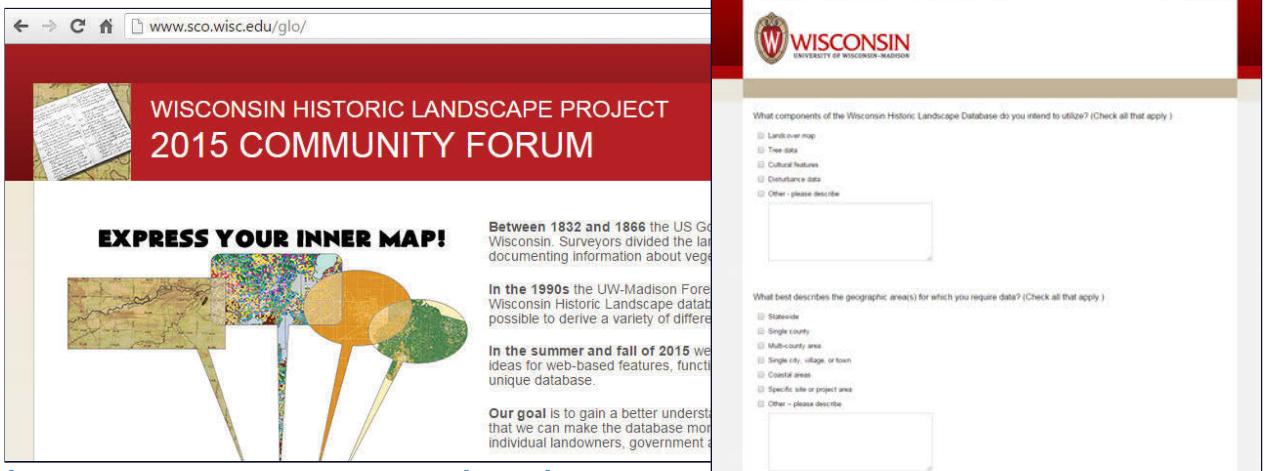
The Wisconsin Historic Landscape Database is a unique resource; few other states have been able to develop similar resources. However, a primary factor inhibiting wider use of the database is the complexity of its format. Geospatial databases typically require Geographic Information Systems (GIS) software, which is expensive and complex to use. Analysis of database requests over the years shows a strong preference for more user friendly formats, including paper maps and web maps.

The UW-Madison Baldwin Wisconsin Idea Endowment awarded a grant to the FLEL and the Wisconsin State Cartographer's Office (SCO) to gather information on user needs and demand for the Historic Landscape Database. As part of this needs assessment the research team held a series of forums at sites around the state to gather community input. The team developed a website, created an online video, and conducted an online survey for the public and workshop participants. The goal was to gain a better understanding of the user community and user needs, to help make the Historic Landscape Database more accessible and useful to interested citizens, community organizations, individual landowners, government agencies, land information professionals, educators, and others.

Needs Assessment as a Tool for Proposal and Program Enhancement

Needs assessment focuses on understanding the user community to ensure their needs and goals are being met. It is a component of the user-centered design paradigm that integrates the needs of users into the design and development process. Our goal in this project was to identify enhancements that would make the Historic Landscape Database more accessible and useful to current and potential users.

We implemented a series of structured forums (or focus groups) throughout the state to elicit information from users about which features of the database are perceived as most valuable. To augment the information learned from the forums, we also developed an online survey.



http://www.sco.wisc.edu/glo/

The database features identified as most valuable, as well as proposed enhancements to the database, were then evaluated to generate a set of final recommendations. These recommendations will be used in future grant proposals to ensure that funding is being used to achieve goals of value to the community.

The needs assessment methodology as used in this context is described in more detail here:

Angima, S., Etuk, L., & King, D. (2014). Using Needs Assessment as a Tool to Strengthen Funding Proposals. *Journal of Extension*. [On-line], 52(6) 6TOT1. http://www.joe.org/joe/2014december/tt1.php

Abstract
In an increasingly competitive funding environment, Extension Services nationwide seek to diversify their funding bases to conduct successful programming and communicate impact to stakeholders. In this article we suggest the use of the Proposal Enhancement Tool, a needs assessment based approach of determining the gap between the current situation and the desired situation, as it applies to a defined audience. This approach requires principal investigators to engage communities in defining the existing problems, determining causes of those problems, and collectively developing solutions to address them. When followed, this approach increases the potential for more successful grant proposals.

Overview of Historic Landscape Forum

During the summer and early fall of 2015, the project team held a series of four community forums at locations throughout the state.

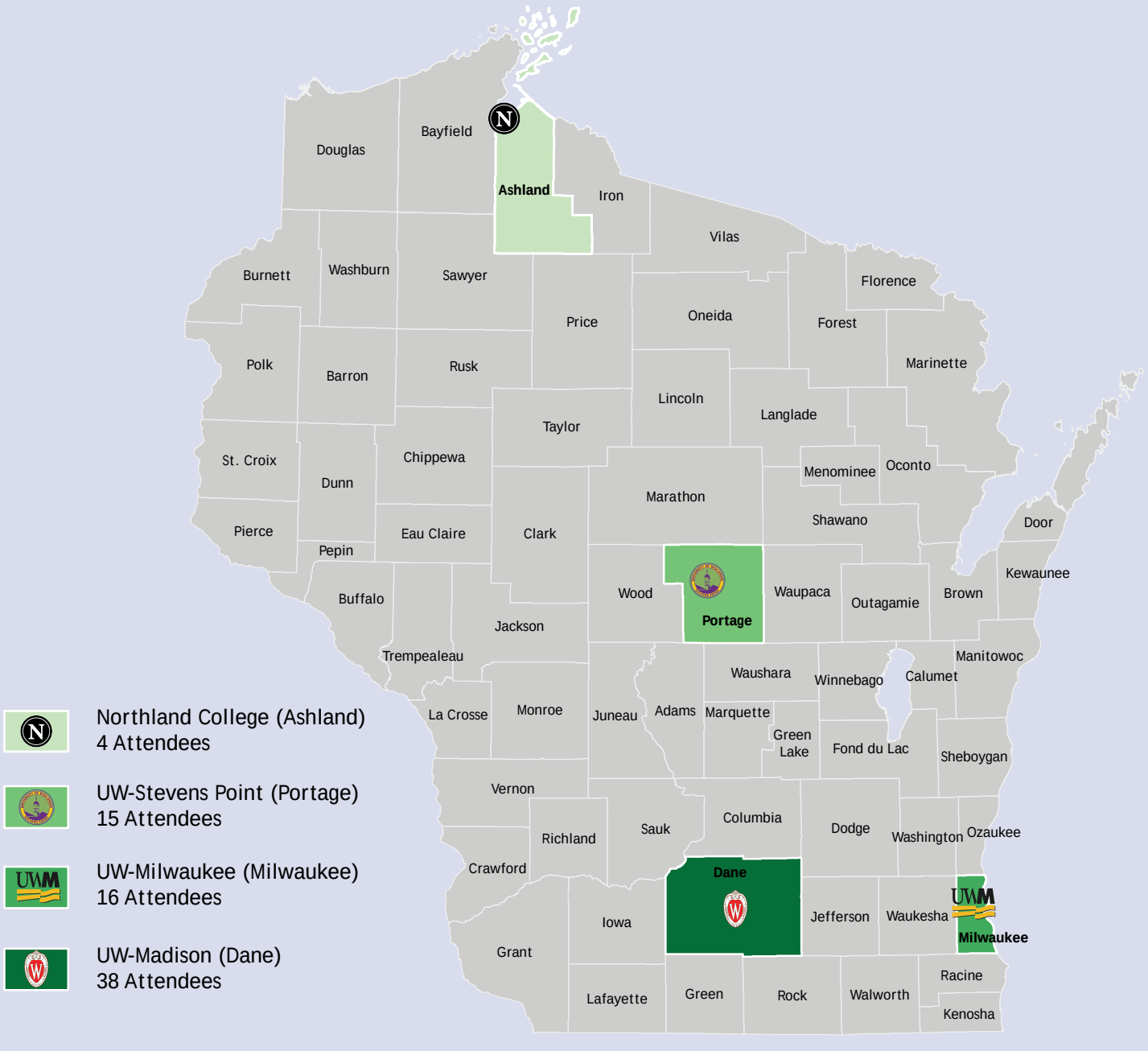
Forum locations and dates were:
UW-Stevens Point on June 30;
Northland College in Ashland on July 15;
UW-Milwaukee on August 4;
UW-Madison on September 23.

All forums were free and open to the public.

Table 1. Forum attendees by affiliation

Affiliation	
Academic/educational	29
Federal government	5
Local government	4
Nonprofit	4
Other	4
Private	8
Regional government	4
State Government	15
Total	73

Fig. 1. Forum locations and attendance



Methods

All forums operated in essentially the same way. After a brief introduction and overview, we conducted a 30-minute presentation on the Historic Landscape Database.

A recording of this presentation can be found here:
https://mediaspace.wisc.edu/id/0_vbb10g1c?width=640&height=360&playerId=25934611

This was followed by group discussion. We arranged participants into tables of six to eight people, making sure each table was somewhat heterogeneous (participants were purposefully mixed together with others they did not already know). Each table was provided with several large sheets of paper and given 30 minutes to focus on each of the following questions:

1. How do you plan to use the database? What kinds of questions will it help you answer?

2. What forms of access do you need? Will you use the actual database or do you need pre-compiled maps? Provide any specific details on data formats or types of maps that you think are important.

After a break, we did a 10-minute report-out on each table's responses, followed by an opportunity for participants to ask questions and throw out ideas.

As a final step we asked everyone to fill out a copy of the survey.

Agenda, Wisconsin Historic Landscape Project Community Forum

:: Coffee and Map Viewing — 30 mins (8:45-9:15)

Opportunity for attendees to look at maps in advance of the formal discussion.

:: Goals and Introductions — 10 mins (9:15-9:25)

Summary of forum goals. Introduction of project team and participants.

:: Background — 30 mins (9:25-9:55)

Four main topics:
1. Background on the project. Why are we here today?
2. Background on PLSS/GLO.
3. Background on dataset (components, features, attributes).
4. Examples.

:: Group Session — 30 mins (9:55-10:25)

Questions for participants.

1. How do you plan to use the database? What kinds of questions will it help you answer?
2. What forms of access do you need? Will you use the actual database or do you need pre-compiled maps? Provide any specific details on data formats or types of maps that you think are important.

:: Break — 20 mins (10:25-10:45)

:: Discussion — 30 mins (10:45-11:15)

Report-out of each table's responses, plus an opportunity for general discussion.

:: Wrap-up — 15 mins (11:15-11:30)

Participants fill out survey.

Forum Responses

Table 2 (below) shows the collective responses from the four forums answering the question: "How do you plan to use the database? What kinds of questions will it help you answer?"

	How do you plan to use the database? What kinds of questions will it help you answer?
Education	To help K-12 teachers find information to support lessons for students
	Help teachers find historical information, develop lesson plans around this information
	Educational: build knowledge that these historic features exist
	Schools use it for education
Land Stewardship	Ecological restoration
	Prioritize landscapes for conservation (unique lands)
	Use to evaluate a likely place for restoration; mitigation, land management
	Restoration opportunities like natural hydrology, water management features, landscapes of concern
	See this mainly used for conservation purposes; to guide management goals and restoration potential.
	Academia and NRCS – use for conservation plans and restoration plans on private lands, people want to know if the plans will work.
	Identify land classification Pre-settlement to better manage current use or restore
Historical Perspectives and Landscape Change over Time	Snapshot of historical vegetation versus current (biodiversity, climate change)
	Use as a baseline indicator for effects of climate change, range of species (e.g. wild rice)
	Land use and land cover change detection
	Inform the public about past conditions: let the data tell a story, showcase ecological conditions of today's landscapes
	Inform why today's landscape is changing
	How people changed the vegetation
	Ecosystems (Habitat) Maps
	Monitor trajectory of change
	Monitoring trajectory of forest change
	Interested in processed data about cover types
	How to use database to enhance historical planning
	Historical perspectives for localities; help to understand what was there in their place of interest a few hundred years ago
	There is a project that is looking at the charcoal history of the driftless area and the PLS data would give a fix in one timepoint in the past
	Identify historic wetlands
	Past and present perspectives; would like to see/visualize changes over time by swiping
	Help interpret and understand historical range of variability for specific locations
	Just helpful to have multiple layers of data and provide prehistoric environmental features
	Use the PLS data to guide where to take soil cores for eco-history of the state
Connection to other Datasets	Return PLS, geology, soil, vegetation, air photos, Bordner maps and data
	Spatial Connections between parcelization and land change
	Can LIDAR be coupled with database? Go to corner and link to database of that corner
	Need to be able to connect the GLO maps where I live
	Connection to statewide parcels
	Comparisons of GLO and current data as fine of a scale as possible
	Combine with current USDA soil maps
	Envision combining these data with plat maps and aerial photos
	See this easily connecting with mapping at UW Arboretum, Aldo Leopold Center, for games as a map layer, connect with paleohistory as well.
Surveyor Notes	Display field notes when clicking on a section or point
	Would like to have notes (narratives) mapped
	It would be interesting to find out how different surveyors did their work (uncover surveyor bias or help interpretation for map making)
	Asked if it would be possible to create a grading system for the surveyors (concern of error)
	For homeowners, should design it so that they can zoom in on an area to see field notes, land cover

Land Management	Use of the GIS data in planning efforts
	Comprehensive planning
	Original vegetation use with biofiltration ponds for stormwater
	Compare to drainage districts
	Inform forest management plans
	Help guide management
	Finding areas of concern
Discern Boundaries	Define landscape boundaries
	Direct application: BLM determines whether particular river islands are ours to manage
	Land acquisition person sees use for when he is interpreting boundary problems between private and DNR lands
Cultural Features Archaeology	Identifying cultural features
	Archaeology and historic information
	Cultural features
	Finding archaeological resources
	Hobbyist, Academics, Researchers – like to see cultural features mapped (snapshot of Bordner and broader over time)
Research	Comments on geology and vegetation
	Understory vegetation
	Use with groundwater modeling
	Search for rare and endangered species
	What information is available
Property Value	Marketing: appeal to historic interest of landowners
	Economic question: value of property (e.g. white pine/hemlock refuge)
	Market to broad audience (often seen as relevance just to preservationists (Cultural features as marketable? Beauty, aesthetics, history could be "marketable" to property owners/buyers and could be tied to property value)
Multiple Categories	Academia, DNR, Private Industry – how do we access it? Need to see it to figure it out.
	Tech expert, educator, project manager, conservationist – all support open-data initiatives
	Education group – database would provide historical context to ecology, regardless of educational level we strive to construct explanations around change; encourage students to consider land-use and climate as drivers
	Images to show general public and for public history
	Identify and protect individual, sensitive species (look at changes in abundance over time, prioritize species based on historical abundance)
	Connection of rights (parcels) to natural landscape to be better stewards of land
	Deeper analysis of past ecology, including paleo in form of products and interpreted results
	Compare landcovers to various land management strategies

Figure 2 shows the number of times different categories were mentioned in responses in Table 2*. This figure identifies common interests for the historic landcover database as viewed by participants of the forum.

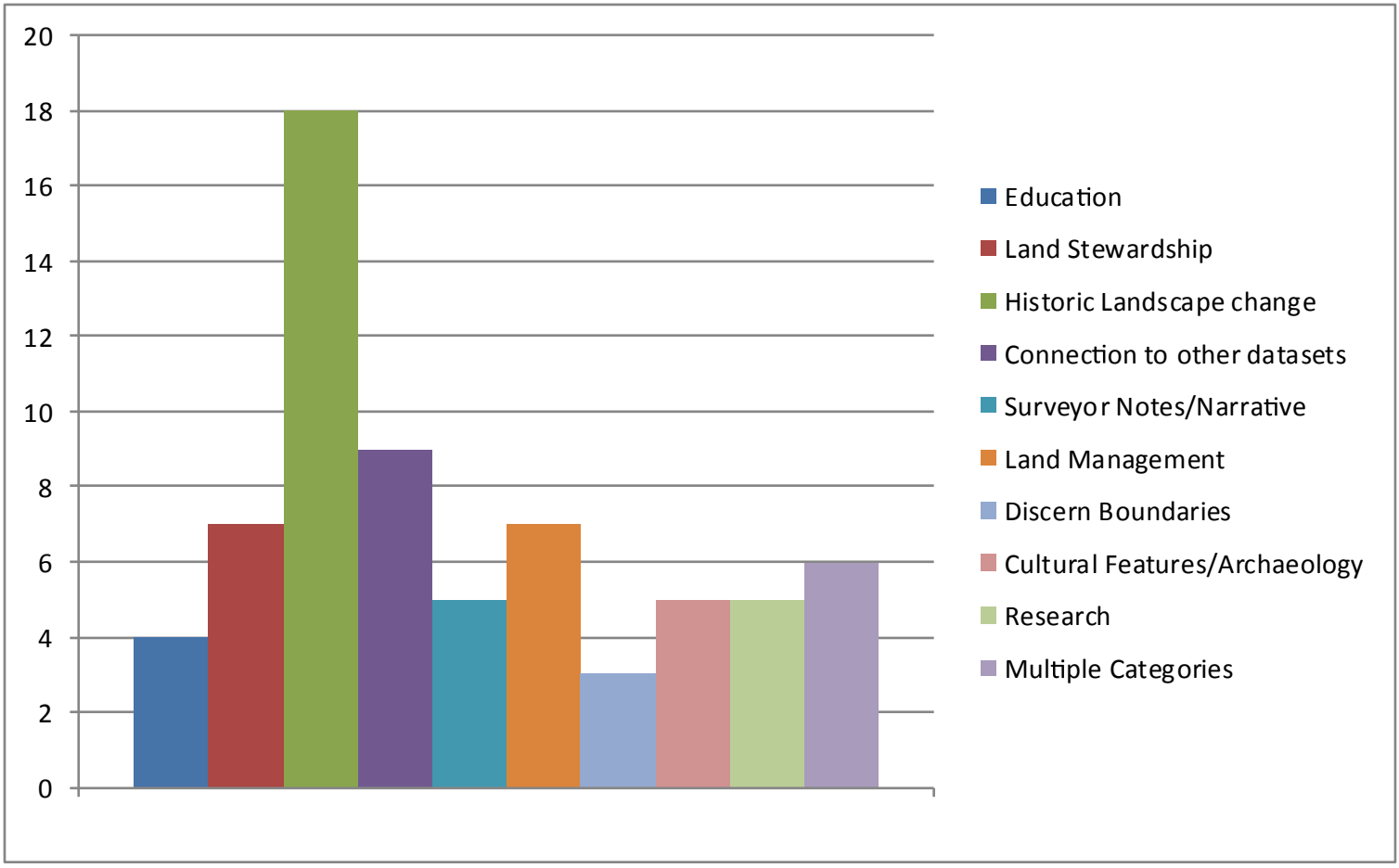
Attendees believed the following themes were of particular importance (mentioned more than 5 times):

- Educating students and the general public on how the present landscape has been altered based on historic land cover and land use
- Land stewardship - focusing on restoration and conservation
- Land use and land cover change over time to indicate climate and ecosystem changes of the past and monitoring a trajectory of change for the future
- Connection to other maps and datasets for comparison and analysis
- Land management including planning, biofiltration, and drainage districts

The following themes were mentioned 5 times or less.

- Access to surveyor field notes to create narrative and identify error/bias
- Defining landscape boundaries and management responsibility between private, state, and federal lands
- Information on cultural features and archaeological resources for academics, researchers, and hobbyists

Fig. 2. Common themes for uses of the Wisconsin Historic Landscape Database.



Note. Responses that include multiple themes are aggregated to one category in Figure 2.

Forum Responses

Table 3 (below) shows the collective responses from the four forums answering the question: "What forms of access do you need?"

	What forms of access do you need?
Web App	Online app (zoom to parcel and see what was there, is it still there, what would it take to restore it?)
	We'll take it as we can get it, but web server would be very useful
	Groups form around common interest, there is an opportunity to create GIS online, world map, community groups; this may be a way to add other products without us actually creating them
	Idea of creating a user group – ability of portal users to share their maps with the community
	Make it part of online geo cortex (DNR system?)
	Web portal; want to be able to select an area and zoom in. Want to know the data are being managed well; authoritative derivatives; meta-data well defined
	Web application to pull data for novice users (non GIS folks), tied to field note scans
	ArcGIS online availability
	Site for academics i.e. thick clients
	Used with ArcGIS online
	Google earth, mapmaker
GIS Data Format	GLO data as GIS layer
	Think the format should be a geodatabase. Stress the importance of data versioning
	DNR and County staff – echo the use of current database within own DNR mapping applications
	Where do you analyze? Not here; want to download and do elsewhere
	Formats: shape files, geodatabases; for others, data conversion kept as close to source
	Shapefiles
	Database, to make own maps
	GIS formats including vector and raster data and tables, but restrict sensitive sites
	How to use the database as an additional GIS layer
Functionality and Interactive Tools	Query database by area and species
	Hotlinks to appropriate GLO survey notes (vs. poor search interface for current GLO scans)
	Searchable by individual species of concern (such as Canada Yew) to see how abundance has changed through time
	Query using lat,long, generate a return of raw data and synthesized data
	Visualization – anything that makes it 3D makes it more accessible.
	For maps we want to zoom to area, rather than having to paste together. Want to be able to define own area for derivative map
	Want to be able to interact with data, not just a static map
	Interactive maps
	Searchable database
	By county
	Timeline tools for parcel change, road networks, rail travel, cover and use change
	Search engine for surveyor points of interest
Accessibility	Make data available in easiest way possible (print and export as pdf at various scales, esri database so users can work with data themselves) Access would potentially be helpful but not required, Google Earth KML
	More user-friendly the better, landcover for dummies
	Pie chart info graphics for geographical unite defined by users
	Data tools – ability to draw a polygon around an area and produce a map of various attributes
	License --- let us know how to reference it; formalize it (open license)
	Filterable cultural features
	See a challenge – big difference in skills. Move towards a portal idea (don't confuse the map for the data, or data for the map…)
	Free and friendly
	Are quirks and nuances of data required knowledge to work with data?
	Would you be a public map service? Allow other organizations and agencies to link to it
	Workshop as to how to search database

Ability to link to Other Datasets	Ability to compare existing (wiscland 2.0 or NLCD) with original
	But should get data out first (to more accessible spot)
	Data availability/error and accuracy
	Is it possible to link to other states if it exists? Link county presettlement maps?
	Would be nice to bring in topographic and soil data to make more helpful
	Link database to aerial photo and notes
	Also include other maps (finley, soils, geology, etc)
	Need to truth the Bordner, in his opinion/experience it is way off
	Use of other sources including: Forest History Association, GLO, WI Historical Society, Bordner, Lewis maps, 1938 aerials
	Couple data with: orthos, topos, glacial geology, settlement patterns, tribal areas, PLSS, soils
	Link GLO database with County Surveyor coordinates of corners
Raw Data	Not using database per se, looking at scanned survey notes; this has potential to save permit staff many hours (if notes were searchable?)
	Raw data are more interesting (with metadata)
	Raw database
	How to access township drawn maps
Processed Data	Provide data at multiple scales
	Different Levels (scales) (qtr section, township, county), Ecoregion, Watershed level
	GLO scans as georeferenced image base layer
	Raw data are already available to everyone, but interested in finer derivative products
Preformed Data	When students are studying an ecosystem that model becomes the only one they see/think about; see these maps and info will be great to bring other examples to them
	Need for detailed polygon map; Curtis did this, was it lost?
	Education – using PLS in schools and plat maps (61/ 78) to show all history, land use history; this helps students get oriented to their place (section level, township data)
	Use of data as a reference, could get by with a static map; uses it when people are interested in property
	Perhaps pre-compiled maps
	Maps, pre-compiled maps of most common themes, examples: Watershed modleing, outreach, education, history, baseline inventory, trends, species expectations, cultural resource prioritization and identification, research
	Story maps around interesting locales
Data Interpretation Guide	Use maps for non-profit work, every so often for work with private individuals
	Wiki – what David and lab have already done (knowledge base)
	How consistent were the surveyors? What is the reliability of the data? Mention of the line trees being inconsistent
	All data; surveyors notes may have something that didn't mean anything to others. Make more accessible; archaeological site
	Question: how are data stored? By year, etc.
	What are some of the assumptions you have used in the database
Other Categories	"I've used shape files to explore areas in empire prairies – drove around and saw remnants that people didn't realize existed"
	Possibility of forming a committee for decision of what to make
	Need ways to report data errors (typos etc.)
	Are sensitive areas an issue? burial sites, mounds fall under cemetery statutes
	Question: has this been done anywhere else in the US? MN data are there
	Oregon Trail type game or sim game
	What products are in the works?

Multiple Categories

Want maps, web servers/services; need relational database
ArcServer service to add to ArcMap
Want the ability to go to a website and query by location (drop a lat,lon and radius), Bordner is critical as well
Need user-friendly interface with web map, filtering and extraction
Are there plans to serve to google earth, Arc GIS online? This would allow linking PLS with other local data in the same session
Want a web map where we can add other public data features (parcels, hydro) and be able to bring your own data into the portal and then download GIS/shape files as well as attribute tables
Would eventually like to see in a web application where it could be combined with other aerials, historic surveys, county GIS departments
Website for general public i.e. thin clients
ArcGIS online, create derivatives or aggregrated maps – but there are millions of these to make. Can we help you create a “top 10” list of thematic maps?
Possibility to digitize (if not already): Bordner maps, Trigg maps, Sanborn fire maps
K-12 will need data and pre-made maps
Georectified index map where you could zoom down to your section of interest and retrieve surveyor notes
PDFs and queries for spatial comparisons for regions
Nuanced things stand out in maps, sand – pine
Challenge is that non GIS professionals think in terms of polygons, ways to auto-generate polygon features from raster
Most DNR staff do not have GIS skills, but the data would helpful to foresters and managers. Need to make it accessible and provide details for people to use more information
For education – not raw data, synthesized map data or be able to query maps
Develop interpretive maps

Figure 3 shows the number of times different categories were mentioned in responses in Table 3*. This figure identifies common interests for the historic landcover database as viewed by participants of the forum.

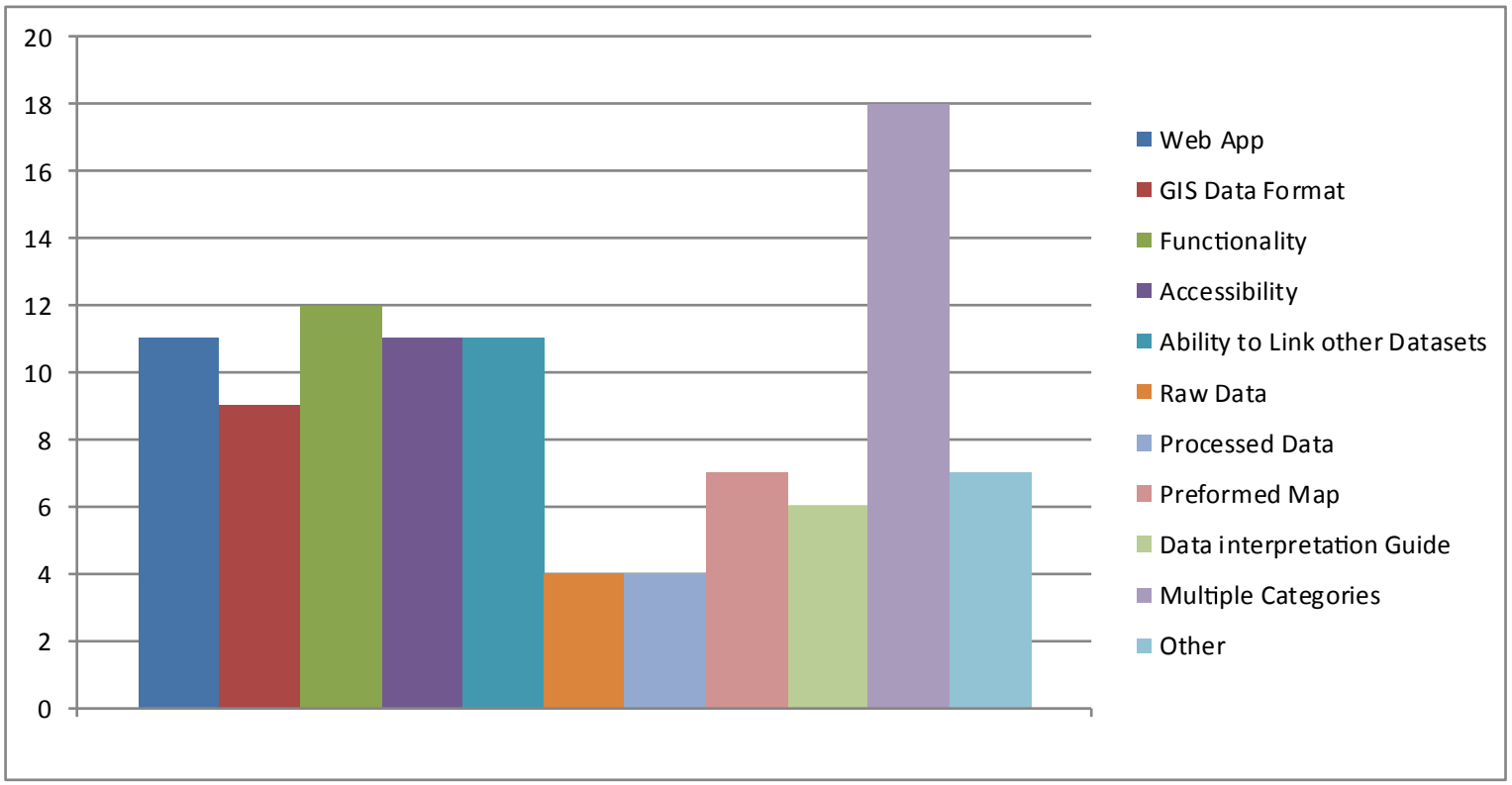
Attendees believed the following themes were of particular importance (mentioned more than 10 times):

- An interactive web application and or use with ArcGIS Online
- GIS Data formats including downloadable shapefiles, geodatabases, vector, raster, and tables
- Functionality and tools to search, query, zoom, and identify change over time in data
- Having the data be free and user friendly so that users of different skill levels can use it
- Ability to link to other datasets, maps, and air photos for comparison and analysis

The following themes were mentioned 10 times or less

- Preformed maps for reference, education, stories, and property information
- Raw database
- Processed data
- Data interpretation guide/wiki to understand nuances in data and where inconsistencies may exist

Fig. 3. Common themes for accessibilty of the Wisconsin Historic Landcover Database.

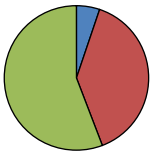


Note. Responses that include multiple themes are aggregated to one category in Figure 3.

Online Survey, Historic Landscape Database Project

Are you interested in the Wisconsin Historic Landscape Database for your personal use or for use by your organization?

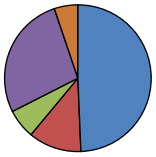
Personal (4) Organization (30) Both (43)



Please describe your organization.

Government (38) Commercial (9) Not for Profit (5)

Education (21) Other (4)



Were you aware of the Wisconsin Historic Landscape Database prior to this event?

Yes (50) No (27)

Have you previously used, or do you currently use the Wisconsin Historic Landscape Database?

Yes (31) No (46)

Do you use GIS?

Yes (65) No (10) No answer (2)

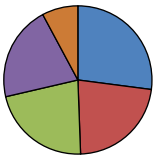
Do you typically use historical data in your work?

Yes (64) No (13)

What components of the Wisconsin Historic Landscape Database do you intend to utilize? (Check all that apply.)

Landcover map (69) Tree data (57) Cultural features (56)

Disturbance data (53) Other (20)

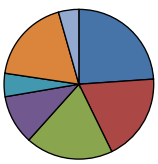


What best describes the geographic area(s) for which you require data? (Check all that apply.)

Statewide (38) Multi-county area (30) Single county (30)

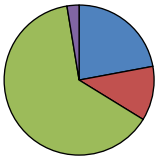
Single city, village, or town site or project area (17) Coastal areas (8) Specific (29)

Other (7)



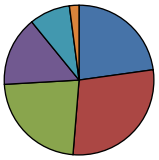
In which format would you require the data?

- Raw data (17)
- Pre-compiled map (9)
- Both (49)
- Other (2)



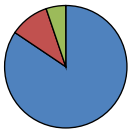
What downloadable GIS compatible layers would be useful to you? (Check all that apply.)

- Esri compatible shapefiles (44)
- Esri compatible geodatabase (55)
- Esri compatible layer files (44)
- KML (Google Earth) (29)
- Geospatial PDF (17)
- Other (4)



Would a web-mapping application with Wisconsin Historic Landscape data be useful to you?

- Yes
- No
- No Answer



What best describes your purpose for using the data? (Check all that apply.)

- Land use planning (36)
- Education (34)
- History (48)
- Wetland (32)
- Conservation (48)
- Forest (34)
- Wildlife (17)
- Other (9)
- Research (47)
- Prairie (29)
- Land survey monumentation (12)
- Personal - sense of place (24)

Has your organization benefited through the use of Wisconsin Historic Landscape Database? (Check all that apply.)

- Improved decision making (24)
- Protection/enhancement of natural resources (24)
- Other -- please describe (16)
- Enhanced public participation and awareness (16)
- Cultural resource enhancement and protection (17)

Discussion

Attendees' responses to the questions during the forum show that there are some common interests related to use and accessibility of the Wisconsin Historic Landscape Database.

Common interests include:

- The ability to link the database to other datasets, maps, and air photos for comparison and analysis.
- Functionality and interactive tools related to searching and querying, specifically for species and temporal data to indicate landscape and ecosystem changes in the past, present, and future.
- Accessibility to data, regardless of skill level.
- Education, broadly, through use of both static and interactive maps.
- Using the data to better manage, conserve, and restore the land.

Common concerns include:

- Reliability of surveyor notes and associated biases.
- Licensing and access.
- Accuracy of data and ways to report data errors.

Users would like:

- Data download and the ability to export data in common GIS formats.
- Map services to allow the data to be integrated into other online maps.
- The ability to visualize and interact with the data online.
- The ability to visualize the data in conjunction with other data layers.
- Access to processed data, such as maps of tree classifications and other interpreted data.
- Collections of pre-made synthesized maps on a diversity of themes.
- Ease of use for less technical audience.

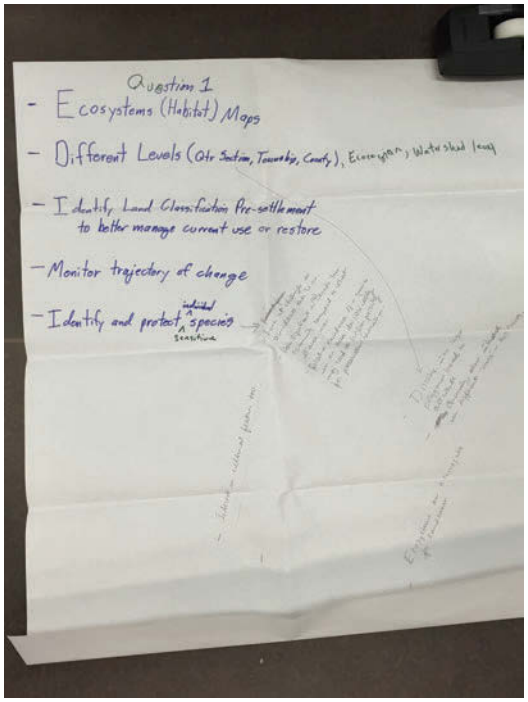
Users would also like:

- Maps of surveyor notes to allow users to identify biases.
- Wiki or data interpretation guides to help understand nuances of data as well as potential for error and areas of concern.
- Workshops on data use instruction.
- More guidance on data use, since the database is based on 200-year-old notes written by different surveyors, and this not free from bias or error.

Conclusion

The responses from our forum attendees and survey respondents indicate significant interest in the Wisconsin Historic Landscape Database.

A prevalent theme we heard many times was the desire to use the database to conduct analyses of ecosystem and climate change. The database can be quite valuable in such analyses due to its unique historical focus and the richness of its content.



A key finding of the study is the wide diversity of interests and potential applications for the database. As such, there is a need for a diverse mixture of database and map components, including both cultural and natural features.

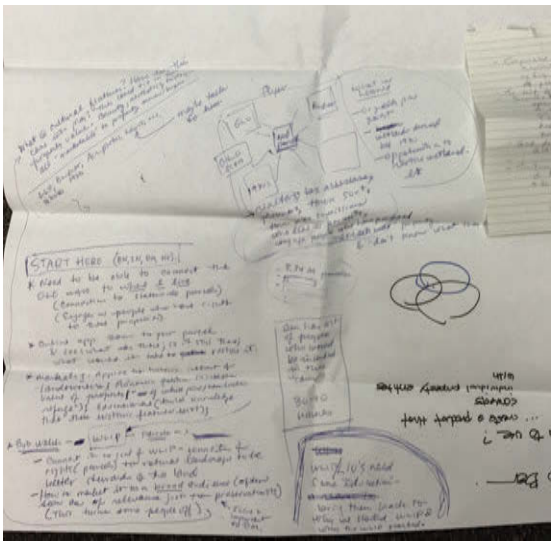
Given the diversity of forum attendees, there is also an interest in a wide range of data needs, from raw data on the one hand to interpreted maps on the other. Attendees also showed an interest in education and training to help ensure proper data interpretation.

Attendees clearly articulated the need for simple data access and visualization tools for non-technical users and educational purposes.

At the same time, there was also a demand expressed for advanced tools for custom data integration and analysis.

In a sense, these results show that users “want it all.” While this finding reflects positively on the wide range of interest in the historic database, it also poses some challenges in terms of identifying priorities for future work, since we are unable bridge all perceived gaps and build all desired tools.

We feel that the best approach is to identify a critical mass of users within a specific area, such as community education, and engage with these users in depth to identify attainable goals that would improve their abilities to access and use the data. Our future efforts will be focused on this approach.



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