

A forum exploring how to utilize the Public Land Survey System to improve parcel map accuracy.

Parcel Mapping and the Public Land Survey in Wisconsin

FINAL REPORT

April 2016

Overview of the Parcel-Survey Forum

In January, 2016, the State Cartographer’s Office (SCO) received a Statewide Outreach Incentive Grant from the UW-Madison Office of University Relations to host a one-day forum entitled, “Parcel Mapping and the Public Land Survey in Wisconsin.” This event was held in the Davies Center at UW Eau Claire on March 15, 2016. The Forum was co-sponsored by the UW Eau Claire Department of Geography and Anthropology, who contributed a matching grant to support the event. The Forum was free to all attendees.

The purpose of the Forum was to foster community-wide dialog about county surveying and tax parcel mapping activities in Wisconsin. The 2016 Forum was the sequel to a similar Forum in 2015, also funded through a Statewide Outreach Grant. The 2016 Forum brought stakeholders together to discuss how to improve parcel mapping methods and better utilize the Public Land Survey System (PLSS) to improve parcel map accuracy and facilitate data integration.

Ninety-eight people registered for the 2016 Forum, of whom 90 (92%) attended. Of the 98 registrants, 14 were UW Eau Claire undergraduate students. (An additional group of approximately 10 UW Eau Claire students also attended for part of the day.) The breakdown of attendees by sector and affiliation is shown in Tables 1 and 2.

Leadership from various organizations was present at the Forum, including current and past Presidents and Board Members of the Wisconsin Land Information Association, the Wisconsin Society of Land Surveyors, the Wisconsin County Surveyors Association, the Land Information Officers Network, and the Wisconsin Land Information Council.

The map in Figure 1 shows that county and municipal attendees primarily came from the north-western part of the state, due to the location of the event in Eau Claire. This pattern compliments the more central distribution of attendees at the 2015 Forum in Stevens Point.

Information on the Forum was published on the SCO website, including

www.sco.wisc.edu/wisconsin-geospatial-news/parcel-mapping-and-the-public-land-survey-in-wisconsin-public-forum.html

Sector	
GIS/Geospatial professional	28
Professional surveyor	25
Student	14
Real Property Lister	5
Other	18
TOTAL	90

Table 1. Registered Forum attendees by sector

Affiliation	
County	45
UW Eau Claire	15
Private company	8
Municipality	7
UW-Madison	7
Federal, State	4
Other	6
TOTAL	90

Table 2. Registered Forum attendees by affiliation

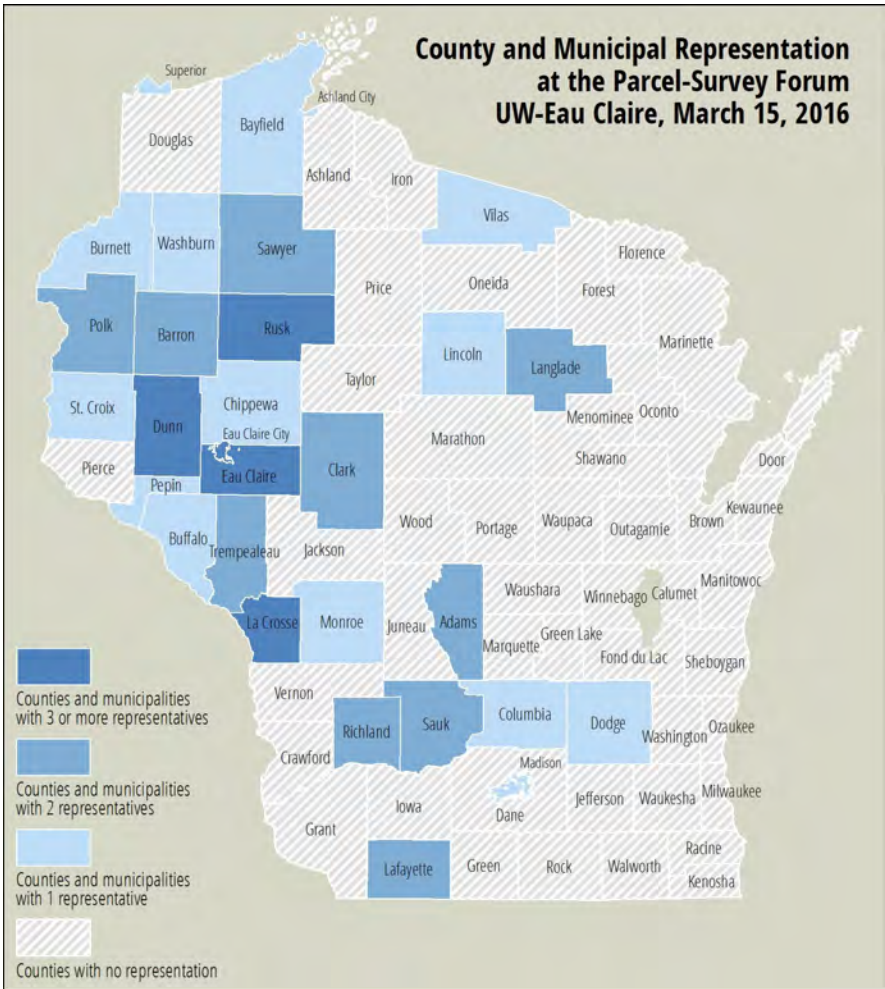


Fig. 1. County and municipal representation at the Forum

The SCO’s website articles on the Forum generated over 1500 unique pageviews, approximately 70% of which were from Wisconsin.

The Forum was also advertised using a variety of email distribution lists and listservs by the SCO. These are listed in Table 3.

List	Approximate number of members
UW-Madison Geospatial Alliance	300 GIS faculty, staff, and students at UW-Madison and other UW institutions
County Land Information Officers Network (LION)	100, including Land Information Officers in all 72 counties of the state and their designees
Wisconsin County Surveyors Association (WCSA)	85, including all designated County Surveyors in the state
Wisconsin Society of Land Surveyors (WSLS)	1000, including most of the state's professional private-sector surveyors
Wisconsin Land Information Association (WLIA)	1000, including professional GIS/geospatial professionals in government, the private sector, non-profits, education, and elsewhere

Table 3. Email distribution lists for Forum advertising

Purpose of the Forum

The Forum brought together stakeholders to discuss how to utilize the Public Land Survey System (PLSS) to improve parcel map accuracy. The forum was attended by county surveyors responsible for the PLSS network, GIS (Geographic Information System) and land information professionals responsible for tax parcel mapping, students, and members of the broader geospatial community representing a cross-section of users.

The PLSS serves as the cornerstone of all property descriptions in the state. The system was established in the 18th century to facilitate land conveyance to individual states and private citizens from the federal government. Original land patents were granted with descriptions based on this system. As such, maintaining PLSS corner monuments is necessary to accurately depict land ownership and interest in real property.

Maintenance and perpetuation of the monuments marking the original surveyed locations of PLSS corners is essential to the integrity of the system. However, across the state, thousands of monuments need to be re-established and modern geodetic coordinates need to be obtained for them. The high cost of this effort is an impediment to its eventual completion.

This topic is of importance due to recent legislation instructing the Wisconsin Department of Administration (DOA) to lead the development of a statewide parcel map. The first version of the statewide parcel map – developed by the SCO and DOA through the cooperation of all seventy-two of Wisconsin's counties – went online in the summer of 2015. An updated version is to be released in the summer of 2016.

Different viewpoints exist within the community about how to coordinate surveying and parcel mapping efforts, and what activities should be prioritized. On the one hand, there is a clear business need and statutory mandate for a statewide parcel map. On the other hand, any parcel map created without a base of up-to-date PLSS data will ultimately need to be readjusted once the PLSS network is complete.

The Role of the University

Outreach and community engagement are ways to guide the development of geospatial policy and practice in Wisconsin. By engaging stakeholders, we can develop a common vision for the state and facilitate the adoption of this vision as a model for the future.

The forum embodies the Wisconsin Idea by linking UW expertise and resources to issues that impact Wisconsin's citizens in all corners of the state. Improved parcel data is needed as the state moves forward with its efforts to transition to the next generation of online information and services for citizens. Through projects like the forum, the University of Wisconsin can continue to be a leader in the effort to improve the efficiency and effectiveness of these services.

The partnership between UW-Madison and UW Eau Claire leverages expertise across institutions for the benefit of students and professionals. The State Cartographer's Office, within the Department of Geography at UW-Madison, has a long history of supporting Wisconsin's GIS and surveying communities. The Department of Geography and Anthropology at UW Eau Claire is a center of GIS education and entrepreneurship in its region. Working together helps maximize benefits as students and professionals collaborate and learn together.



Forum Structure and Agenda

The agenda for the Forum is shown below in Table 4.

The Forum was moderated by SCO Staff members.

The morning and afternoon sessions were kicked off by a series of four short presentations to stimulate discussion.

Attendees were seated at tables of six to eight people each.

There were two group discussion sessions for each table.

Discussion focused on the following questions in the morning:

- ➔ How accurate do parcel maps need to be and what aspects of accuracy are most important?
- ➔ How does the PLSS help improve accuracy?

In the afternoon, the following questions were discussed:

- ➔ How can we balance the needs for positional accuracy against users' needs for a complete statewide parcel map?
- ➔ What strategies will ensure that PLSS will still be prioritized and completed?

In a final scorecard session, participants were asked to respond to the following question:

- ➔ What is the most important step we can take to improve parcel map accuracy?

Participants' scorecard responses were then ranked on a scale of 1-5 by five other participants, resulting in a cumulative score between 5 and 25 for each response.



Time	Activity
9:00-9:15 am	Introduction, goals
9:15-10:15 am	4 @ 15-minute presentations: Codie See & David Vogel (SCO); Steve Geiger (Polk Co.); Peter Strand & Dean Roth (Eau Claire Co.); CeCe Tesky (Rusk Co.)
10:15-10:45 am	Break
10:45-11:00 am	Open microphone
11:00-11:30 am	Group discussion at each table
11:30am-noon	Report out, discussion
Noon-12:45 pm	Lunch (not provided)
12:45-1:45 pm	4 @ 15-minute presentations: Jason Poser (Buffalo Co.); Mark Netterlund (Barron Co.); Brett Budrow (St. Croix Co.); Dan Pleoger (Sawyer Co.)
1:45-2:15 pm	Break
2:15-3:00 pm	Group discussion at each table
3:00-3:30 pm	Report out, discussion
3:30-3:45 pm	Scorecards
3:45-4:00 pm	Scorecard report out and next steps

Table 4. Forum agenda

Group Discussion Sessions

During group discussion sessions, each table responded to several questions related to parcel mapping and the PLSS. Each table's responses to the questions were recorded on a flip chart.

Table 5 summarizes responses to Question 1: "How accurate do parcel maps need to be and what aspects of accuracy are most important?"

Theme	Number of Mentions
PLSS and surveying	
Accurate PLSS = accurate parcels	1
Without PLSS a parcel map is just an index of parcels	1
Parcel maps should be as accurate as possible with incremental improvement (PLSS, GPS)	1
A parcel map is not a survey: Need to educate users that a survey is more accurate	1
Important to have a survey mindset when parcel mapping	1
One-foot accuracy on a corner is NOT okay; Should be survey grade	1
County boundaries must fit	1
Overlaps	
Adjacent parcels should not overlap	1
Separate gaps or overlaps from the parcel polygon layer, or put a note on the screen indicating that there is a discrepancy in the area	1
Some believe there are no overlaps (senior rights)	1
Currentness	
Updates must be done in a timely fashion	2
Real time data comes through the RPL (Real Property Lister)	1
Current ownership (what does user want first?)	1
Consistency	
Accuracies should match across the dataset as much as possible	1
QA/QC	
Need to check all records	1
Deeds and property descriptions	
Deeds can be obscure and hard to read	1
Parcels only show deeded property, not title to property	1
Users	
Different aspects of accuracy are important depending on final use and purpose	2
Everything is important because people make decisions based on the information shown	1
More accuracy = more uses	1
Accuracy priorities depend on the end use: Owners need completeness but for taxation currentness also important	1
For land owners positional accuracy is important	1
Municipal/urban users may need increased accuracy	1
Accuracy is relative: use (taxation, zoning), photo, legal descriptions, setting (urban, rural)	1
Other	
Expert knowledge matters (LIOs, RPLs, and others who understand regional quality)	1
Documentation/interpretation in different circumstances and different scales	1

Table 5. Summary of responses to Question 1

Table 6 summarizes responses to Question 2: "How does the PLSS help improve the accuracy of parcel maps?"

Theme	Number of Mentions
Foundation	
It is the starting point for all section subdivision (parcels)	1
It gives a firm starting point	1
Everything (descriptions) is based on PLSS	1
It is the foundation (without which you have just a map)	1
It is the stable foundation	1
It is the framework and our grid	1
It defines the hierarchy	1
It locks down framework to build land divisions/deeds	1
It's essential!	1
Ties things together	
It ties it to real world	1
It ties it all together	1
It ties the title to the mapping	1
Improves accuracy	
Improves positional accuracy	2
Provides an accurate point of beginning	1
It starts with a fixed location	1
It is more precise	1
It depends on how accurate PLSS is	1
Improves property descriptions	
It provides a better representation of deed property	1
Deed not always accurate	1
Anybody can write a land description. Poor land descriptions maybe based on railroad tracks or something that no longer exists.	1
Can help discover bad metes and bounds descriptions	1
If the corners are accurate, that's a good framework for future descriptions	1
Has been in place for a long time -- good chance that that description that references PLSS is going to be more accurate	1
It represents a realistic representation or where the section lines are in contrast to a flown aerial photo	1
Having an undisputed PLSS layer can help with parcel mapping	1
Takes previous assumptions out	1
Other benefits	
Improves acreage accuracy (GIS, Mapping)	1
Confines error within an area (county, township, section)	1
Future descriptions/mapping should improve	1
Georeferenced makes PLSS retraceable	1
Helps with clean up in areas that are not mapped accurately	1
It helps with accuracy and completeness and currentness	1
Shooting interior monumentation is valuable	1
Older subdivision areas may not be helped by improved PLSS	1

Table 6. Summary of responses to Question 2

Table 7 summarizes responses to Question 3: "How can we balance the needs for positional accuracy against users' needs for a complete statewide parcel map?"

Theme	Number of Mentions
Understand users' needs	
Accuracy priorities depend on user needs	4
Positional accuracy	
Positional accuracy should be as accurate as is needed by its most stringent user, a. i.e. the property owner (or some parcel owner); the zoning administrator	1
Positional accuracy should be accurate within ~6 inches would be a reasonable expectation	1
Education	
Educate our group and end users	3
Communication and education needed	1
Educate county government by setting up a consortium	1
Educate public, county board members, and professional services about uses: family farms depend on land surveys; able to provide accurate acreages; equitable taxation	1
Communication of parcel layer expectations (map disclaimer, verbiage of parcel map)	1
Create a map combining parcels map completion and PLSS accuracy to more accurately show status of parcel mapping	1
Coordination	
Coordination needed	1
Inter-county cooperation first (branch out from there later)	1
Balance improves as we, as a group, come together	1
Strategy, planning and priorities	
Establish goals, plans, and priorities	4
Sell it to new county boards and convince them to invest	1
Balance political influences	1
Concept of PLSS before parcels	1
Local/county focus	
Get county boundaries to fit together using a standard coordinate system	1
Strategize locally and pursue these priorities: areas without parcel mapping; problem areas; populated areas	1
Local prioritization and knowledge is important	1
Flexibility and discretion to counties in their PLSS vs. parcel mapping (context-specific)	1
Take a long view	
Accuracy will come over time, and we need to be patient and accept some inaccuracy as inevitable	4
Aim for perfect and complete, but accept that you must make progress and stick to a budget	1
Standards	
State standards for mapping/consistency	1
Mandate minimum standards for parcel mapping to give you something to stand on and have tiered funding (those who have nothing done get funds to get it done)	1

Table 7. Summary of responses to Question 3

Table 8 summarizes responses to Question 4: “What strategies will ensure that PLSS will still be prioritized and completed?”

Theme	Number of Mentions
Funding	
Continued funding needed	6
Local funding may be insufficient	1
Tiered funding	1
Show progress to continue receiving funding	1
Balance funding between counties that have good PLSS and those that do not	1
Balance funding between PLSS and mapping	1
Planning	
Include PLSS in long-range plan/land information plan	2
Plan to complete PLSS must be done at local level	1
Treat it like a puzzle, focusing on county boundaries first	1
Demonstrate success for county and municipal boundaries first	1
Tiered priorities: county boundaries; municipal boundaries; development areas	1
Policies, procedures, and standards	
Set realistic goals and benchmarks	3
Establish mandates	2
Promote surveying policies	1
Statutes	1
Make PLSS the top priority	1
Tie PLSS to statewide objectives like the parcel map	1
Education about PLSS benefits	
Educate elected officials/commissioners/county board/LIOs	3
Educate public	3
Educate other professions (realtors, lawyers, appraisers/assessors)	1
Community engagement/fact sheets for distribution	1
Highlight specific uses and benefits	
Forestry and mining need accurate property boundaries	1
Flood plain insurance	1
Zoning setbacks	1
Reduction in survey costs	1
Ascertain user needs	1
Other resources	
Promote county surveyor position	1
Have a professional surveyor on county/LIO staff	1
Need a state surveyor to encourage/direct funding	1
Time	1
Personnel	1
Accept that PLSS won't be complete in the near future	1
Collaboration	
Collaboration and communication	1
Bring together people with similar goals	1

Table 8. Summary of responses to Question 4

Scorecards

In the scorecard session, participants were asked to respond to the question: “What is the most important step we can take to improve parcel map accuracy?” Table 9 shows each scorecard response grouped by score as well as the main issues identified in the response.

Responses	Issues Identified [see key below]							
Total score of 25	PLSS	Fund	Educ	Bdry	Parcel	Plan	Train	Coll
Accurate county boundaries.				x				
Base parcel map on PLSS corners that have a survey quality geodetic (county coordinate) value put on them.	x							
Complete PLSS remonumentation/coordinate values.	x							
Complete the PLSS.	x							
Continue funding for a benchmark and with a focus on finishing county boundaries first.		x		x		x		
Educate the government (local) about the whole concept of parcel mapping and how it ultimately falls back on and relies on the PLSS. The PLSS is the backbone of so many decisions that are made on local and county levels and education to all is important.	x		x					
Finish the PLSS.	x							
High accuracy PLSS and education.	x		x					
Increase the amount of quality survey data, starting with PLSS re-tracement work, and use this data to assemble the framework of the GIS parcel map.	x							
Remonument the PLSS. Tie state funding to the status of PLSS remonumentation accuracy.	x	x						
Start by remonumenting and map-integrating PLSS corners and inter-jurisdictional boundaries (county - county; county - municipal; county - tribe).	x							x
Tie it to the public land survey.	x							
Tiered funding to make PLSS first priority in relation to other fundamental elements with consideration to unique county needs.	x	x						
Work on getting the PLSS established over long term, while continuing to provide mapping needs to the best of our ability short term, while never losing sight of the long term goal.	x					x		
Work toward complete PLSS remonumentation and coordinates.	x							
Total score between 20 and 24								
Accurate coordinates on PLSS and tie mapping to PLSS.	x							
Acquire PLSS.	x							
Complete the PLSS corners and put coordinates on them.	x							
Getting funding to complete the corners for the PLSS so we can get accurate maps for public and government uses.	x	x						
Identify the problem, find a solution and implement it. Not all accuracy problems are PLSS related.						x		
Improved PLSS. Have a full time county surveyor to get PLSS work done and continue mapping and re-do areas as corners get more accurate.	x						x	
Provide strategic initiative grants at \$50,000/year for 2016-2026 to each county to be used exclusively for PLSS remonumentation (or maintenance) and after 2026 require counties to use \$25,000/year from retained fees for PLSS maintenance.	x	x				x		
Key PLSS=Focus on PLSS, surveying, accuracy Fund=Secure Funding Educ=Conduct education & outreach Bdry=Fix county boundaries Parcel=Complete parcels Plan=Establish plans, goals, benchmarks, standards Train=Training and staff qualifications Coll=Collaborate, communicate, coordinate								

Table 9. Scorecard results (continued on next page)

Responses	Issues Identified [see key below]							
Total score between 20 and 24	PLSS	Fund	Educ	Bdry	Parcel	Plan	Train	Coll
Complete the PLSS remonumentation.	x							
Continue to provide funding to remonument PLSS. Adjust parcel mapping accordingly.	x	x						
Educate the general public and people in authority so they understand why it is important to improve parcel map accuracy. Once people understand the reason why then the money/funding will occur.		x	x					
Educate the public and other professions about the importance of parcel map accuracy and the benefits these maps hold. The more knowledge about parcel accuracy the more money obtained to create more accurate maps.		x	x					
Obtain accurate PLSS and have the parcel mapping done by qualified and knowledgeable mapping technicians.	x						x	
Prioritize certain parcels above others and begin with those until a statewide database can be created with mapped parcels of the needed accuracy for each county.						x		
Complete PLSS.	x							
Educate county boards and others as to the importance of tying the parcel map to the PLSS.	x		x					
Funding for PLSS, qualified surveyor.	x	x					x	
Provide funding for PLSS and simultaneously develop a statewide parcel mapping standard.	x	x				x		
Stakeholder collaboration to establish funding, user education, and state standards for county boundaries and surveying techniques.	x	x	x	x		x		x
Statewide database with accuracy standards and a push for more informed and educated public in addition to local and statewide officials being educated.			x			x		
Communicate why it is important to users, whether they be government agencies, private companies, realtors, hunters, or others. Survey quality coordinates on PLSS remonumentation.	x		x					
Continue to fund PLSS in the long term. Communicate with neighboring counties in the short term.	x	x						x
Coordinate and communicate with all parties involved in surveying, mapping and recording. Update and promote PLSS and mapping with the county commissioners and the public.	x		x					x
Educate the end users so they know what can and can't be done with the parcel map. Educate those who control funding and explain the value that PLSS plays in a county parcel map and greater state-wide parcel map.	x	x	x					
Insist on using PLSS to control parcel locations.	x							
Keep improving the accuracy of the boundary surveys that the parcel maps are based upon.	x							
Patience - after 25 years, the PLSS is still talked about in relation to parcel mapping which is the priority. Needs are different for each county and the funding/staff/leadership are also different.						x		
PLSS and other surveying.	x							
The importance of parcel map accuracy is seen differently from all different people. Educating why accuracy is important to those not in the know will go far in terms of awareness and ultimately funding that could be used to implement techniques to make more surveys more accurate.		x	x					
Key PLSS=Focus on PLSS, surveying, accuracy Fund=Secure Funding Educ=Conduct education & outreach Bdry=Fix county boundaries Parcel=Complete parcels Plan=Establish plans, goals, benchmarks, standards Train=Training and staff qualifications Coll=Collaborate, communicate, coordinate								

Table 9. Scorecard results (continued on next page)

Responses	Issues Identified [see key below]							
Total score between 20 and 24	PLSS	Fund	Educ	Bdry	Parcel	Plan	Train	Coll
The most important step would be setting realistic goals that can be met or surpassed.						x		
Education to the people working on parcel maps, education to the community, and education to the younger generations who will need to know this in the future.			x				x	
Remonumentation of corners, making updates more often, require better/more accurate legal description.	x							
Secure proper funding towards securing means of maintaining technology and updates to existing survey. Education of public and county officials must also be an ongoing process.	x	x	x					
Total score below 20								
Define level of accuracy for different levels of land use: urban, suburban, rural, forest. Different levels can help define levels of effort.						x		
Educate the importance of an accurate parcel map to those with money; use different associations to get the point out that a PLSS system is needed.	x	x	x					
Education of elected officials. Consortium of "like-minded" professionals who will form a unified voice to be presented to counties throughout the state. The SCO should form a committee of "like-minded" professionals to develop an outline of speaking points to be distributed to organizations (WLIA/WSLS/WCSA) to draft a letter to every county clerk describing why the parcel map and PLSS is important.	x		x					
Funding.		x						
Get your parcels tied to PLSS coordinates (survey grade).	x							
Identify a very specific long term achievable goal then create a series of benchmarks (baby steps) to get there. (i.e. % of PLSS (?) to be recovered or GPS)						x		
Indicate which areas are parcel mapped with survey grade accuracy and which areas are not yet mapped with that kind of accuracy. Survey grade mapping accuracy vs. not survey grade mapped areas. Less accuracy but still mapped to show general location.						x		
Not giving up. Stick with the plan and cooperate with adjacent counties.						x		
PLSS and other survey control along with qualified mappers.	x						x	
State/county/local stakeholders must develop education and minimum standards for counties to meet for funding eligibility.		x	x			x		
Base the mapping on the PLSS.	x							
Establish PLSS and tie parcels to monuments, education and funding.	x	x	x					
Counties that have a full time surveyor help those counties that do not, kind of an "adopt-a-county" program. Mentor/suggest/look over RFP for survey work RFP's. Look over data the adopted county receives from consultants.	x						x	x
Educate county board and municipalities of importance of land records/PLSS.			x					
Show how parcel mapping benefits the counties.			x					
Begin mapping parcels from recorded deeds and surveys starting from the nearest PLS marker.	x							
Key PLSS=Focus on PLSS, surveying, accuracy Fund=Secure Funding Educ=Conduct education & outreach Bdry=Fix county boundaries Parcel=Complete parcels Plan=Establish plans, goals, benchmarks, standards Train=Training and staff qualifications Coll=Collaborate, communicate, coordinate								

Table 9. Scorecard results (continued on next page)

Responses	Issues Identified [see key below]							
Total score below 20	PLSS	Fund	Educ	Bdry	Parcel	Plan	Train	Coll
Give people the time to get the things done. If the counties are rushed their information will be more likely to be wrong.						x		
Set standards - something to be accountable to.						x		
Community outreach.			x					
Making decision makers aware of the importance of having accurate maps.			x					
Get the parcels done.					x			
Short attractive easy to understand mail fliers could be sent out with bullet points noting property owners reasons and importance of knowledge on how this can help and affect them. Possibly more people to step forward to get this completed.			x					
Keep doing what we are doing. Open discussion among professionals keeps the process moving forward.								x
Key PLSS=Focus on PLSS, surveying, accuracy Fund=Secure Funding Educ=Conduct education & outreach Bdry=Fix county boundaries Parcel=Complete parcels Plan=Establish plans, goals, benchmarks, standards Train=Training and staff qualifications Coll=Collaborate, communicate, coordinate								

Table 9. Scorecard results



Online Survey

An online survey was administered after the Forum. A total of 40 responses were collected. The graphs below show the responses to a series of survey questions on Forum content and design.

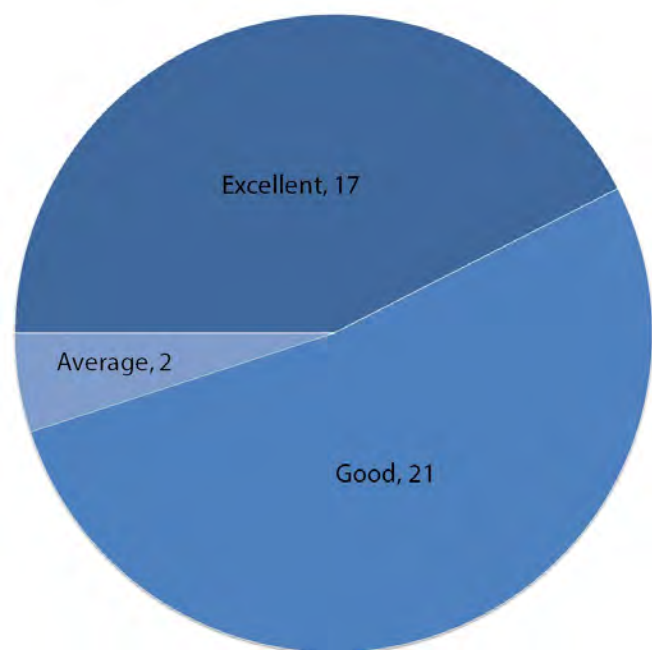


Fig. 2. Overall experience with the 2016 Parcel-Survey Forum



Fig. 3. Likelihood of attending a similar Forum next year

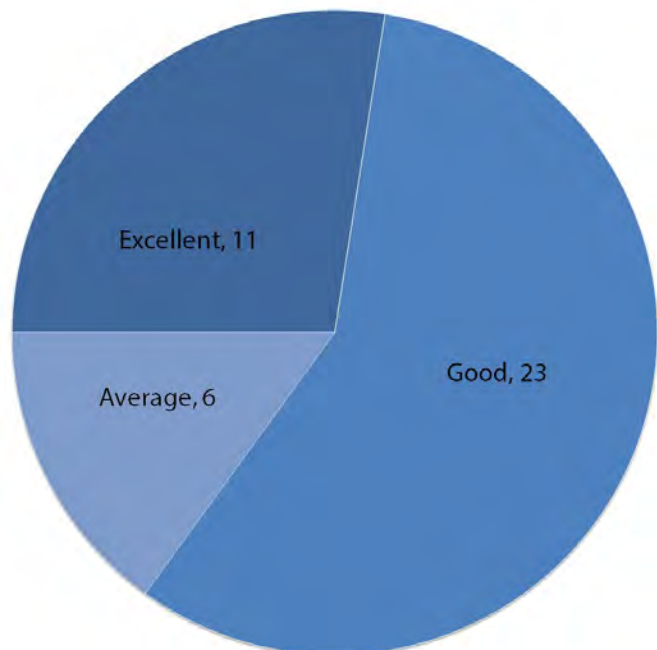


Fig. 4. Quality/usefulness of presentations

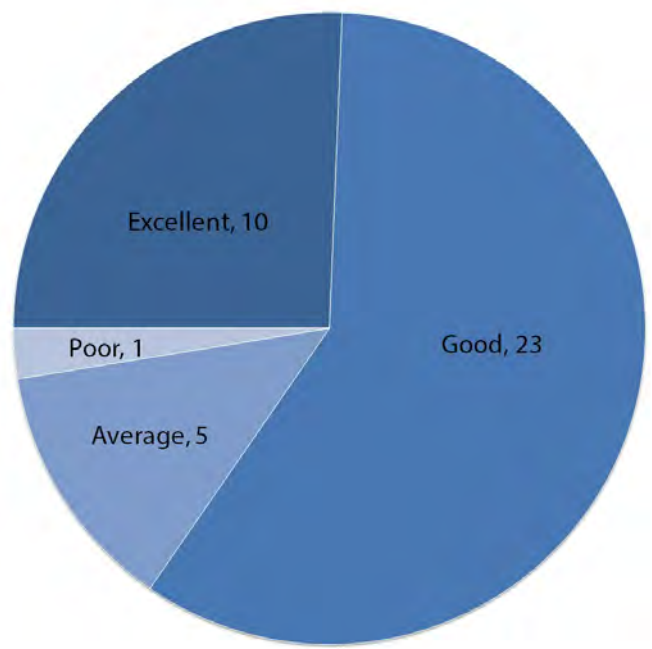


Fig. 5. Quality/usefulness of discussion sessions

Table 10 shows the responses to the online survey question: "What, if anything, would have improved the Forum this year?"

What, if anything, would have improved the Forum this year?

It was new to me and I enjoyed it all.

Even more attendees.

Attendance by more of the DOA higher ups.

Table Numbers; Wider Variety of Participants (I'm not complaining but a little surveyor heavy); More County Elected Officials. Get them to come and have a program geared toward why the PLSS and the Parcel Map are so darn important. Maybe some of the grant money should be used for this purpose? Get the holders of the purse strings to be present even if it takes paying their daily wage?

More examples of what the state parcel layer is used for on a statewide basis.

Have a 15 minute session that shows the progress and benefits of the program. Real world benefits directed towards the counties. Have speakers that are using or going to use the data base. It is easier to come up with the solutions when you know and understand the users needs. Have a talk on the steps that need to be followed to set a Section Corner.

The breakout session questions seemed to be too general, and too few. Don't spend so much time on each question.

Discussion questions weren't open ended enough to lead to valuable discussion. At times, there were only a couple possible options so going around to all the tables seemed to waste time.

Expand the discussion and engagement. For example not sure why the emphasis on modernizing County PLSS boundaries. What's the cost, what's the benefit? Is it showing progress or? Is the LIS community loosing sight of the original mission? That being a "Modern (Multipurpose) Land Information System (see Epstein et al. where we make the case that modernization must address both "Land records and information (that) contain material about the location and status of land features. (And) They also include the land rights, restrictions, and responsibilities (called land interests or property rights)." See Preface, p.xi, Epstein and Niemann, 2014).

This program was great at identifying perceived problems. I sensed the biggest issue was to geo reference elements of the PLSS. Absent the last few minutes minimal time was allocated to formulating and executing an effort to undertake a means of solutions...Creation of ammunition to help influence those holding the check books would be a great next step.

Shorten the breaks which will shorten the day.

Allowing participants to ask more questions of speakers.

More time per presentation for at least an additional 15 minutes of discussion after each.

No rain, but that is out of your control.

Weather

Maybe a more central location like the Dells or Steven's Point area.

Charge \$20 and provide a noon meal.

Table 10. Responses to online survey question 1

Table 11 shows the responses to the online survey question: "What kinds of topics would you like included at the next Forum?"

What kinds of topics would you like included at the next Forum?
Anything that would be valuable to those of us who do already have digital PLSS at least partially in place.
Discussion about content standards for parcel fabric. Discussion about mandating WLIP funds to any non-county entity (cities/villages) that is performing parcel mapping and property listing for any particular county.
Free data sharing through websites in order to bring data into a project or map.
Get to the point of collaboration between County Surveyors to come to a consensus on corners on County lines so we don't have double corners. Or is the difference in the coordinates because of a different datum between the 2. Are they both sitting on the same monument but getting slightly different coordinates?
How accurate do we need the statewide parcel map, and how much money do we want to spend on the state-wide parcel map? When is good enough actually good enough?
Ideas for funding PLSS
Instead of how counties have gotten to this stage, how about projects that are underway and what they are using the money for. We've seen several presentations about what counties have done and not done. Perhaps it is time to see how our forums have been put into action.
Looking more at the funding issues and thus brainstorming to make that end of it happen.
Methods to progress quickly on achieving state-wide parcel mapping.
Not sure.
Orthophotography vs. Oblique Imagery vs. LiDAR and its ROI vs parcel mapping and PLSS, it seems to be a point of contention you will see come out of the Land Information Council discussions between representatives on the council the parties they represent. People want flexibility in how they spend their money. So the question is would acquisition of one of these items be more or less important and of the three which one is the most useful at this time.
Precision agriculture
Someone who can give real time/cost figures on correcting all parcels when one section corner moves (coordinates are updated to 'survey grade'). Not sure of how much County Boards know about the importance of the PLSS, so maybe encourage the LIO's to bring a Land Council/County Board member along at the next session like this. I almost said next year but maybe another one this year with Land Council members.
Speaker about the value and utility of statewide parcels. Also address from that scale the importance or lack thereof of spatial accuracy.
Standards for the creation of the data file verses precision of the user. Survey precision is overkill for the county that wants new lines for school districts.
Topics relatable to the Assessor. Topics relatable to the treasurer. Topics that the County Board of Supervisors cannot ignore. Direction, we need to make the parcel mapping PLSS work. There needs to be solid, specific outcomes, and goals to enable the stakeholders to communicate and get this done. It's going to take time, but we all need to keep committed and do it. Perhaps it could be more about County Elected officials so they can see the meaning, purpose and importance of what we are trying to accomplish?
Update on "Where are we now?" Which would include statistics gathered from the Land Information Plans submitted by each county. Ranking of counties by percent complete with PLSS and also parcel mapping. Who is struggling? What can we do to help? (Neighboring counties?)

Table 11. Responses to online survey question 2

Table 12 shows the responses to the online survey question: “Is there anything about the Forum format/agenda that could be improved?”

Is there anything about the Forum format/agenda that could be improved?
15 min breaks would've been plenty.
Breakout session comments need not be read aloud. They could just be gathered and used in online polls to gather importance. The poll results can then be further discussed in other forums.
Format was very good for this type of session. Lots of interaction and discussion from everyone in the group. A more central location... might have brought in more people.
I believe that we spend too long reiterating the responses from table to table. We should just note that if the next table has a different take to share it otherwise we could move on a bit quicker and that would leave more time to debating the pros and cons or deciding what the most important course of action is. The final part where we write down our answer and it is rated is excellent.
I think the format is good, I think we need to promote the forum to the WLIP (although the DOA is present) and make the forums outcomes a consideration for future initiatives. I like that 2015 was Stevens Point. I like that 2016 was Eau Claire, I hope that 2017 is Superior, 2018 is Pembine, 2019 is Appleton, 2020 is Milwaukee, 2121 is Madison, and 2022 is Lacrosse.
Just want to comment--great venue!
Lots of counties gave the same talk. "Here's an update of how far/behind our county is" after a while they all seemed the same. I think the Discussion towards the end was beneficial but dominated by a few.
No, it was a pretty good format and good discussion occurred.
Over all a good format for discussions. Nice touch to have everyone move for the second discussion.
Perhaps find a way to invite those that are not in the survey/mapping industry but still rely on our end product. It would be nice to see county board members, real estate representatives or title companies in attendance so they can see the value of what we are trying to do. Perhaps looking at some of the examples of what happens when you 'guess' at making maps will put some perspective on how important the PLSS is and why we need to remonument and maintain these positions.
Student (undergraduate) involvement
We don't need any more history lessons on how each county developed their PLSS and/or parcel mapping.

Table 12. Responses to online survey question 3



Table 13 shows the responses to the online survey question: “What other types of activities or events would be useful?”

What other types of activities or events would be useful?
A bimonthly or quarterly news letter. It forces you to keep the project moving forward and also keep it in the minds of people like me. Also people are more interested in and willing to help something if they can see that meaningful progress is being may.
If we are able to gain a better understanding of where counties/municipalities are struggling, then we can offer workshops or breakout sessions that address those needs. There are open source spatial databases as well as open source GIS platforms that perform very well. Some of the counties that are struggling may benefit from knowledge of those. We have been very successful with open source programs at Chippewa County.
If we have a room divided on a result a caucus would be interesting. Do you side with A or B or are you truly undecided.
Just a suggestion, not a directive. I am a surveyor, I have thoughts and topics that are important to me. I sat with PLS's, RPL's, and with Mappers. Somehow the types of people sitting at a table need to be distributed evenly, so were not heavy one way or the other. Your process is terrific, the presenters, the break outs, but the audience needs to be dispersed so that healthy communication can occur. I feel like some of the SCO folks are growing tired of the PLSS issue because they want to map, they have the information to map, but the PLSS is a real life issue and needs to be accounted for otherwise we will keep on at the same pace we've been on for the last 40+ years. Let's take care of this, reach a compromise and move forward.
Leave a time for misc. concerns and suggestions
Precision agriculture
Suggest a volunteer from any WLIO office either bring a CPU workstation to the forum, or coordinate a webinar demo, to illustrate some 'real world' parcel mapping workflows that GIS folks encounter on a daily basis. This would be educational not only to all the folks whom are responsible for performing parcel mapping in their respective offices, yet an eye opener for the Professional Surveyors who are not involved with these efforts and may not realize the challenges/problems that the GIS folks encounter during these efforts.
Tips and tricks, others have found useful, and a hand out of them to take home.

Table 13. Responses to online survey question 4



Core Themes and Ideas

The text blocks below are amalgamations of comments, statements, and responses by Forum attendees, grouped by theme and edited to reduce duplication. They are not actual quotations. They represent the core themes and ideas expressed at the Forum.

We need to complete the PLSS and use this data to improve the GIS parcel map. We should base the parcel map on surveyed corners with accurate coordinates. PLSS is essential for accurate parcel maps. Without PLSS, a parcel map is just an index of parcels.

PLSS is the foundation and framework for all subdivisions. PLSS ties things together and ties things to the real world. It eliminates the need to rely on assumptions. It improves accuracy, provides a fixed point of beginning, and helps identify and improve poor property descriptions. PLSS has other benefits too...it can improve computed property acreages, enhance future mapping and property descriptions, and confine errors to one area.

Education about PLSS and parcel maps is critically important. Users need to understand that a parcel map is not a survey and does not show title to property. Users need to be educated about the limitations of parcel maps. Disclaimers are part of the solution. The target audience includes the general public as well as professionals like realtors, appraisers, assessors, lawyers, government agencies, private companies, hunters, and so on.

We also need to be sensitive to the needs of the user. Maps need to be accurate because users make important decisions based on them, but the importance of accuracy depends on the use and purpose of the map and the needs of the user.

We need to educate decision-makers about parcel mapping and PLSS. PLSS and parcels are the backbone of so many decisions that are made at the local level. Once people understand this there will be more support and funding for projects. We need to reach out to elected officials, county boards, LIOs, and others. They should come to the next Forum. This education should highlight the benefits of accurate parcel maps and PLSS data -- including forestry, mining, flood plain insurance, zoning, reduction in survey costs, and so on.

We also need to come up with a way to more accurately depict the completeness of the parcel layer in each county. Mapping parcel completeness is not good enough, since this can make it look like the county is done even though PLSS is still incomplete.

Education and training is also needed so that parcel mapping is done by qualified and knowledgeable mapping technicians.

More coordination is needed. Inter-county coordination should come first, then move out from there. We should keep communicating and collaborating, and bringing people together with similar goals. We should use stakeholder collaboration to establish funding, conduct user education, and set state standards for county boundaries and surveying techniques. There should be open discussion among professionals to keep the process moving forward.

One priority for collaboration is county boundaries. Boundaries should match, with no gaps or overlaps. We need to work together to solve this problem.

Another thing we need is continued funding. Completion of PLSS needs to be funded. Funding might be "strategic" -- for example it could be tiered, tied to progress on PLSS, based on PLSS status, and so on. Strategic initiative grants specifically for PLSS could be provided to counties every year.

We also need to fund the county surveyor positions, and maybe even have a state surveyor to direct funding.

We need to set and follow goals, strategies, and priorities. PLSS needs to be part of the long-term plan. It needs to be a top priority and tied to statewide objectives, just like the parcel map. This will help justify the effort in each county and help balance political influences.

Any plan also needs to include statewide standards to ensure mapping consistency and efficiency. For example different levels of accuracy can be defined for different levels of land use: urban, suburban, rural, and forest.

It is important that we rely on local knowledge, so that we can offer flexibility and discretion to counties to complete the process in their own way. Needs are different for each county and the funding, staff, and leadership are also different.

We may need to go beyond strategies and priorities. What about setting mandates and policies, maybe even modifying statutes.

Even with additional funding, time, and personnel, PLSS will not be complete tomorrow. Accuracy will take time and effort, and we need to set realistic goals and benchmarks. We should focus on getting PLSS completed over long term, while continuing to provide mapping needs to the best of our ability in the short term.

Contact Us!

We are interested in your thoughts and ideas, and your suggestions on how to move forward. Please contact us!

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