Implementing a Montana PLSS Data Stewardship Program

Problem: The Montana Spatial Data Infrastructure's (MSDI) Cadastral and Administrative Boundary themes are heavily reliant on a well maintained Public Land Survey System (PLSS) data set. In the past this data set has been developed through the Bureau of Land management (BLM) Cadastral Survey Program for Geographic Coordinate Database (GCDB). The BLM has standardized the PLSS data set it has collected through the GCDB into a format that is consistent with the national cadastral Data Standards, generally termed the CadNSDI. The BLM is in the process of assembling and developing PLSS data for all 30 Public Domain States in the CadNSDI format. The current version of the PLSS Standardized data is termed CadNSDI v2 or CadNSDI 2.

In Montana the CadNSDI 2 has had multiple known problems associated with it including numerous edge match errors which have been fixed and changes to the special survey point ids which have not been corrected. We acknowledge that Montana state and local government GIS programs may use CadNSDI 2 in ways that other states don't and therefore apply more scrutiny to the products delivered by BLM. We often feel like the BLM doesn't really understand why we need what we need which makes it more difficult to correct the problems. Finally, because our parcel accuracy is primarily tied to the accuracy of the PLSS data, many areas that have high error estimates, as observed via overly of aerial imagery, are in need of more attention than the BLM can presently provide. It is time to take the long standing data partnership between the State of Montana and BLM another step forward, with the State stepping up to take on a measure of responsibility for quality assurance and accuracy enhancement of the PLSS.

Quality assurance, by definition attempts to improve and stabilize production and associated processes to avoid, or at least minimize issues which led to the defect(s) in the first place. Current federal budget realities, coupled with vast amount of PLSS data covering Montana because of geographic size, are two reasons why the data quality associated with Montana CadNSDI is difficult to maintain. A state/federal partnership to provide joint PLSS stewardship is the most logical path toward improved PLSS data quality in Montana.

Program Name: The Montana PLSS Data Stewardship Program

Program Owner: As current stewards of the MSDI Cadastral, Administrative Boundary and Geodetic Control themes the Montana State Library (MSL) Geographic Information Program would have oversight over the program. MSL considers PLSS to be part of the MSDI Cadastral theme which is why it is distributed along with the tax parcels, conservation easements and other cadastral elements. MSL Geographic Information would operate the program with the interests of all state, local, federal, tribal and private sector PLSS data users in mind. The program would report annually to the Montana Land Information Advisory Council and an annual PLSS Quality Assurance Plan would be included as part of the statutorily required the Montana Land Information Plan. If there was interest a PLSS working group or user group could be formed.

Program Staffing: Ideally the program would be led by a licensed surveyor familiar with current PLSS measurement management concepts and process as well as GIS, and related tools for editing and reporting from the GIS. However the nature of cadastral measurement management systems is currently changing, being integrated into more traditional GIS software. We believe it likely that in the future trained GIS analysts within the MSL Geographic Information Program will be able to manage PLSS data stewardship.

Program Funding: Short term program funding would come from existing state and federal resources. The Department of Revenue has a licensed surveyor familiar with measurement management concepts on staff who could be assigned to the program during an initial proof of concept phase. MSL has approximately 2 years left on an existing assistance agreement with BLM with approximately $50,000 that could be used to help build the program. Because the program, if successful, would improve the PLSS for our federal partners we believe that federal funding over a 10 year transitional period should be made available. In the long term MSL would be responsible for marketing the program to other state, local, tribal and private sources, as well as exploring legislative options to keep the program operational.

Conceptually how it Works:

There would be a one year proof of concept period whereby methodologies and workflows would be tested, documented and agreed upon between the State and the BLM. Initially this is how the State sees it working:

1. The BLM and the State of Montana establish Data Stewardship areas. This means there will be areas of Montana where the State will be responsible for the update, enhancement, improvement and ongoing maintenance of the PLSS Data in the CadNSDI. The BLM will remain the Data Steward in areas with federal management or a high degree of federal interest and on tribally managed lands. The State and the BLM will concur on the location, including the coordinate positions of points along the boundary, of the lines delineating the boundaries of Stewardship responsibility. Lines of common or shared data stewardship will be held fixed by both parties until there is agreement by both parties to update or change the boundaries of data stewardship and associated PLSS points and polygons along those boundaries. Within the designated data Stewardship areas the designated data stewards will be responsible for updating the PLSS data elements based on new control, new surveys or other changes or updates to the PLSS data elements using accepted measurement management tools and methodologies.

2. The BLM and the State of Montana adopt a common initial version of the PLSS. The State proposes that it be a mutually agreed upon clean version of CadNSDI 2 with the special survey id's corrected, because it contains the most recent adjustments based on the ARRA points as well as control from Gallatin and Park Counties.

3. The State of Montana obtains measurement management and other relevant training from BLM for two or more employees. State PLSS data stewardship must have fail-over protection and not be totally dependent on one person.

4. For the proof of concept phase the State program will prioritize townships, or blocks of townships within the state's area of jurisdiction for improvement. Two known blocks are around Rapelje in Stillwater County and the Rockvale/Edgar area in Carbon County. Different areas may require somewhat different methodologies. For example the Rapelje area may dependent on new GPS control while the Rockvale/Edgar area may be fine with existing control but input of private surveys.

5. The State of Montana will leverage local government sources for assistance with assembling corner recordation records, private surveys, or public relations gaining access to private land.

6. The State of Montana will adjust the prioritized areas within their jurisdiction, put them in the state's version of the PLSS, and review the impacts and effects of the adjustment. If positive the state will accept the adjustment and adjust the parcels and boundaries (in partnership with local GIS where appropriate) accordingly. Providing that local government GPS collections fall within areas of state jurisdiction the State of Montana would adjust those areas. The BLM will adjust the PLSS as they deem appropriate within areas of their jurisdiction. Development of some sort of feature level metadata may be helpful to document adjusted townships.

7. On a regular documented basis the State of Montana and the BLM will merge their data into a single common CadNSDI data set that can be used and relied upon by all users on a regular basis. Because the boundaries of data stewardship will be held fixed, there will be no gaps or overlaps introduced along data stewardship boundaries.

8. The State of Montana and BLM will meet regularly to discuss modifications to the process in order to produce a product that benefits and meets the needs of the broader GCDB user community. These meetings may include other users, for example the US Census Bureau, the Montana Department of Revenue, Local Governments, and others dependent on accurate, measurable, and dependable PLSS data.