A Brief History of the Public Land Surveys in Minnesota

Why the points and lines are where they are and not somewhere else

MACS 2010
The Rectangular Surveys in Minnesota

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Minnesota Association of County Surveyors
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Historiography of Surveying
I am not competent to talk about corner monuments or centers of sections

I'm not fixated on

- particular records, such as field notes and township plats, although I do look at them
- specific features, corners or lines, although I do look at them

I focus on surveying process and the suite of records that are available to reconstruct that process

Look for patterns at different spatial and temporal scales
My Perspective

Detail necessary to describe and explain the public land surveying process to one audience – land surveyors of Minnesota

Of limited geographical applicability
My Perspective

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Of limited geographical applicability

Generalizations to provide an overview of the surveying effort throughout the United States 1785-1925 to other audiences – non-surveyors

• many of whom take the surveying efforts for granted
• many of whom are only interested in the outcomes of the surveys

Only some of which is useful to the surveyor
How did the public land survey lines spread?
What geographies can be constructed?
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Useful generalities for the surveyor and non-surveyor?
How did the public land survey lines spread?
What geographies can be constructed?

Useful generalities for the surveyor and non-surveyor?

Survey Lines spread in a concatenated manner throughout the United States – multiple geographies
The government system of surveying is in some respects peculiar and unlike any other, and no adequate facilities have been afforded surveyors not employed in the public service to make themselves acquainted with its rules and principles.

Hence it is in many cases impracticable to make instructions intelligible to the local surveyor, without first giving some explanations as to the manner in which the public surveys are executed.
In 1855, a manual of instructions to regulate the field operations of United States deputy surveyors, was prepared and printed under the direction of the General Land Office.

Other instructions had been printed at earlier periods, but the manual prepared in 1855 embraced all the improvements suggested by the experience of the surveying department up to that time, and was much more comprehensive and complete than anything of the kind which had preceded it.
Uncomfortable “Truths”

The surveys spread across the lands owned by the United States expediently

Some characteristics of the surveys makes no geographical sense today
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Some characteristics of the surveys makes no geographical sense today

What we don’t know – all the details of the surveying operations during the entire 60 years, 1847-1908

• Not necessary to know
• Not had time/inclination to look

• Not had the data to investigate – i.e. digital images of the plats and the notes
Land System

Native American Land Cessions

Public Land Surveys

Public Land Conveyances
The lines and monuments (points) comprising the rectangular public land survey net provide the basis for the organization of space based on private landownership – created place from space.
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They were the basis of a new geography

- They defined the location and the boundary of each parcel of land the United States government would subsequently sell or donate to individuals, corporations, and states – providing legal descriptions – some of which have been remarkably persistent
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At present the monuments have assumed greater importance, particularly in urban areas
"Nicked" from Pat Veraguth

Number of PLSS corners in each county
The PLS descriptions have shown a remarkable persistence and continue to be relevant.

Land Act of February 11, 1805

“All the corners marked in the surveys, returned by the surveyor-general …shall be established as the proper corners, of the sections, or subdivisions of sections, which they were intended to designate ….”

“The boundary lines, actually run and marked in the surveys returned by the surveyor-general …shall be established as the proper boundary lines of the sections, or subdivisions, for which they were intended”
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Minnesota Statutes (2017) Statutes 389.04

“In subdividing townships, sections, or parts of sections, as established by the United States survey thereof, and in restoring lost or obliterated government corners, the county surveyor shall follow the rules established by or pursuant to acts of Congress, and all such surveys shall be made in strict conformity to the original survey made by the United States”

Minnesota Statutes (2017) 389.05

“County boards shall procure and file with the county recorders of their respective counties certified copies of the original plats and field notes of the United States surveys”
The Public Land Surveys

Transformed "formless wilderness into a remarkable national geometry of squares and rectangles"
The Public Land Surveys

Transformed "formless wilderness into a remarkable national geometry of squares and rectangles" 117-32
The Public Land Surveys

Transformed "formless wilderness into a remarkable national geometry of squares and rectangles" 117-32
The Extent of the Geometry
Gaps in the Geometry
They “imposed a spatial frame of reference on virtually all human activities in the United States – it formed part of a democratizing effort”

“The fact that the grid could … subdivide a continent into minute, graph-paper squares might appear to be simply a triumph of the mathematician’s art, but the ease with which it made land available to anyone who went west in search of it had an almost incalculable influence on the development of the American psyche and the American economy”
A Critique of the Public Land Survey System

Our Public Land Survey System is such an intricate part of our culture that any critique of it comes close to the condemnation of motherhood and apple pie.

To make it even worse, the System did admirably what it was designed to do, to allow the government to disperse of millions of acres of public land in great haste and at fire sale prices, without giving much thought to the consequences.

It has, of course, been criticized for reasons that have nothing to do with surveying.
The Public Land Survey Lines Spread in a Complex Manner

Because of the Conflicting Demands

Imposed by pressure on the federal government to create landowners in widely different localities

- based upon the necessity of surveying unknown areas quickly and cheaply in the face of a demand for land from individuals, corporations, and states
- a demand satisfied by American Indian land cessions followed by migration and settlement of European Americans
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Imposed by the needs of a surveying process

• to create a coherent rectangular net

• to create a national locational scheme
Surveys were carried out simultaneously in widely separated localities
1. An administrative system comprising statutorily defined surveying districts and Presidentially appointed surveyors general – established when necessary
But there is a coherent national network of lines and points Made Possible by Two Characteristics

An administrative system comprising offices of Surveyors General - operating fairly independently - and a cadre of contracted deputies working under a set of instructions

Surveyor General of the North West
1796-1857

Surveyor General of Wisconsin and Iowa
1838-1863

Surveyor General of Minnesota
1857-1908
Surveying districts not confined to a particular state, at least initially

Surveys administered by a Surveyor General who were quite independent of each other until 1851 – Oregon Manual

Commissioner of the General Land Office awarded Surveyors General some portion of the annual appropriations Congress made for surveying in the United States (in addition to salaries)

Surveyors General made an annual report to the Commissioner of the General Land Office
The rectangular surveys lines spread throughout Minnesota between 1847 and 1908

1847-1857 Surveys carried out by the Office of Surveyor General of Wisconsin & Iowa

• 1846 Instructions issued by the Surveyor General of Wisconsin and Iowa
• 1851 Instructions issued by the Commissioner of the General Land Office
• 1855 Modification of 1851 Instructions issued by the Commissioner of the General Land Office

The rectangular surveys lines spread throughout Minnesota between 1847 and 1908

1857-1908 Office of Surveyor General of Minnesota

- 1855 Modification of 1851 Instructions issued by the Commissioner of the General Land Office
- Modified and republished 1864, 1881, 1890, 1894, 1902
The rectangular surveys lines spread throughout Minnesota between 1847 and 1908

Minnesota only state that shows

- how the Atlantic surveys were prosecuted <1851
- how the Pacific surveys were prosecuted >1851
But there is a coherent national network of lines and points
Made Possible by Two Characteristics

A technical system dividing the United States into discrete areas in which primary surveying and locational control was imposed by a principal meridian and a baseline
Locational system – Principal Meridians and Baselines – established as necessary

An Initial Point created by intersection
• A north-south Principal Meridian
• An east-west Baseline

Each township is a number of townships
• North or South of the Baseline
• East or West of the Principal Meridian
A Locational System that involves the position of a parcel in a township

Defining boundaries and location of land parcels – legal description – with reference to

- The distance and direction of a township from an initial point and
- The location of the parcel in the township

https://en.wikipedia.org/wiki/Township_(United_States)
Surveying – Field Work

- Meridian
- Correction
- Exteriors
- Subdivision
Surveying Operations

1. Contract awarded and instructions given to run a correction line – Field notes returned
2. Contract awarded and instructions & diagram given to run township exteriors – Field notes returned, diagram of exteriors drawn
3. Contract awarded/instructions to subdivide a certain number of townships & diagram of township boundaries given - Field notes and diagram returned
4. Plats and descriptive notes compiled
5. Field notes copied – notes for township exteriors and subdivisions combined – and sent to Washington DC with duplicate plats (Commissioner’s plat)
6. Triplicate plat (Register’s plat) and descriptive notes sent to land district office
Surveying – Office Work

Each portion of the fieldwork involved – contract, correspondence, instructions, field notes, sketches, diagrams

At end of the fieldwork – field note transcriptions, correspondence, field examination, township plats, descriptive notes

- field note transcriptions, correspondence, township plats sent to the General Land Office
- township plats, descriptive notes sent to Land District Office

Minnesota Historical Society Government Records. Minnesota Secretary of State

Field Notebooks

Field notes are the narrative record of the survey

- what the deputy surveyor said he did, sometimes when, and when and what he saw
- what instruments he used
- who helped him

1,410 volumes totaling nearly 310,000 pages

Raw data from which the township plats were drawn and the descriptive notes compiled
Township Exteriors
W. 149-25 J P Hinchilwood June 7, 1875 approved May 6, 1876
N. 149-25 J P Hinchilwood June 7, 1875 approved May 6, 1876
W. 149-26 J P Hinchilwood June 7, 1875 approved May 6, 1876
N. 149-26 J P Hinchilwood June 7, 1875 approved May 6, 1876
W. 149-27 J P Hinchilwood June 7, 1875 approved May 6, 1876
N. 149-28 J P Hinchilwood June 7, 1875 approved May 6, 1876
W. 149-25 J P Hinchilwood June 7, 1875 approved May 6, 1876
N. 149-25 J P Hinchilwood June 7, 1875 approved May 6, 1876
W. 149-26 J P Hinchilwood June 7, 1875 approved May 6, 1876
N. 149-26 J P Hinchilwood June 7, 1875 approved May 6, 1876
W. 149-27 J P Hinchilwood June 7, 1875 approved May 6, 1876
N. 149-28 J P Hinchilwood June 7, 1875 approved May 6, 1876
146-28 P.H. Conger contract June 11, 1873; approved July 8, 1874
147-27 P.H. Conger contract June 11, 1873; approved July 30, 1874
146-28 J B C Baldwin contract June 25, 1875: approved April 18, 1876
3rd Correction Line
Henry A. Wilmar, Depy. Sur., do solemnly swear, that in pursuance of a contract with Geo. W. Jones, San. Supt. U.S., dated 22d of May, 1847, and to strict conformity to the laws of the U.S. and the instructions of the Civil Survey, I have regularly surveyed the foregoing portion of the Third Correction Line on the Survey of Minnesota, and I do further solemnly swear that the foregoing are the true and original field notes received as aforesaid.

Henry A. Wilmar
Depy. Surveyors
Township Exteriors

Began at an established township corner, ran north, south, east, or west in 6 mile increments setting monuments

- Every mile – 80 chains – for a section corner
- Every half mile – 40 chains – for a ¼ section corner

Ended by setting a new Township Corner
James Marsh, Deputy Surveyor, do hereby certify that on the 23rd day of July, in the year of our Lord nineteen hundred and forty-one, I made a survey of the tract of land described in the deed of转让 from the United States to the State of Wisconsin, and that the same was made in conformity with the laws of the United States and the instructions of the Surveyor General. The foregoing township boundaries were established by the survey of the Fourth Principal Meridian, as per act of Congress, and I, James Marsh, Deputy Surveyor, do hereby certify that the foregoing are the true original files of the said survey made as of date.

James Marsh
Deputy Surveyor
P. B. Long
Judge of Pleas

Chicago Land Office, Illinois

I, C. M. Booth, Surveyor General, do hereby certify that the foregoing is a true copy of the record of the original field books containing the surveys executed by James M. Marsh, Deputy Surveyor, under the contract of May 25, 1867, as contained in the survey of the premises of the District Attorney, U.S. Circuit Court, in the Territory of Minnesota.
Turns out some township exteriors run in a complex manner
Township subdivisions

Began at an established township corner and ran north, south, east, and west in 1 mile increments setting monuments

- Every mile – 80 chains – for a section corner
- Every half mile – 40 chains – for a ¼ section corner
- Where line intersected “impassable” object
- Tied lines into existing corners on township lines
Isaac N Higbee

Contract Sept. 3, 1847
26-21 Oct. 14-19, 1847
27-21 Oct. 14-20, 1847
28-21 Nov. 13-16, 1847
29-21 Nov. 17-23, 1847
30-21 Dec. 18-25, 1847

Notes approved?
Isaac N Higbee

Contract Sept. 3, 1847
26-22 Oct. 21, 1847
27-22 Oct. 21-23, 1847
28-22 Oct. 24-27, 1847
28-22 April 10, 1852
28-22 August, 1852
28-22 Aug. 9, 1852
29-22 Nov. 24-29, 1847
29-22 Jan. 17-18, 1853

Notes approved?
Dividing sections

Northern and western tiers – contain all errors

Quarter section lines protracted between monuments established midpoint along section lines

All lines subdividing a section, must be straight lines running through the section from the corner in one boundary to its corresponding corner in the opposite boundary of said section

Quarter sections divided by landowner

Government lots – have no dimensions merely an acreage
The deputies ran township exteriors and section lines – placing monuments every half mile or where the lines intersected and where they intersected an “impassable object” – most often a water course – creating townships, sections, and quarter sections.
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The government sold land in the smallest legal subdivisions – quarter-quarter sections, and irregular government lots.

Some lines were drawn by draftsmen and later run by private surveyors hired by the landowner.
The Township Plat – the first large scale maps over much of the United States – 2 inches to the mile

- The location of the township in the United States
- The location of the boundaries to parcels of land in the township
- Specific topographic features
- A contemporary description of the land surface
Missing - The Register's Plat
Township Plats
Anatomy of a Township Plat
Anatomy of a Township Plat

Sketch diagram from the exterior deputy
Sketch diagram from the subdividing deputy
Township exterior diagram
Field notebook from the exterior deputy
Field notebook from the subdividing deputy
A Unique Location in the United States

Township No. 114 N., Range No. 28 West of 5th Mer.
<table>
<thead>
<tr>
<th>Surveys Designated</th>
<th>By Whom Surveyed</th>
<th>Date of Contract</th>
<th>Amount of Surveys M. Ch. Lk's</th>
<th>When Surveyed</th>
<th>When Changed in the Sur. Gen's Acc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Township lines</td>
<td>John Ryan</td>
<td>June 4th, 1855</td>
<td>24, 60, 85</td>
<td>June July 1855</td>
<td></td>
</tr>
<tr>
<td>Subdivisions</td>
<td>Denis Longton</td>
<td>March 10th, 1856</td>
<td>85, 54, 90</td>
<td>South &amp; East 1856</td>
<td></td>
</tr>
</tbody>
</table>
The above Map of Township No. 114 North of Range No. 28 West, 5th Principal Meridian Minnesota is strictly conformable to the field notes of the survey thereof on file in this Office which have been examined and approved.

Surveyor General's Office

Ponagosa, Feb. 20th. 1857

Warren Lewis
133-32 – thanks to Terry Freeman (Cass County)

<table>
<thead>
<tr>
<th>Line</th>
<th>Deputy</th>
<th>Field Note Vol.</th>
<th>Contract Date</th>
<th>Survey Date</th>
<th>Approved Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>North</td>
<td>Harvey Mellon</td>
<td>E5141 4-10</td>
<td>July 19, 1858</td>
<td>June 26</td>
<td></td>
</tr>
<tr>
<td>West</td>
<td>Harvey Mellon</td>
<td>E5141 11-19</td>
<td>July 19, 1858</td>
<td>June 27</td>
<td></td>
</tr>
<tr>
<td>East</td>
<td>Oscar Taylor</td>
<td>E5125 49-107</td>
<td>Dec. 27, 1857</td>
<td>ND</td>
<td></td>
</tr>
<tr>
<td>West R resurvey</td>
<td>Geo. Wright</td>
<td>E5316 179-201</td>
<td>July 23, 1863</td>
<td>Sept. 16</td>
<td>April 23, 1864</td>
</tr>
<tr>
<td>Subdivisions</td>
<td>Geo. Wright</td>
<td>I5425</td>
<td>July 22, 1862</td>
<td>Sept. 3-17</td>
<td>Nov. 10, 1863</td>
</tr>
</tbody>
</table>
The way in which sections were subdivided and designated changed through time, even during the sixty years of the surveys in Minnesota.

Previous to about 1858 parcels on the northern and western exterior of townships were not given numbers – except if a water body lay in the parcel - although the acreage was noted on the plat.

In 1863, when the plat was drawn, and in 1862 you have this bizarre system.

In 1870 the lots in sections were numbered sequentially in an anticlockwise manner.

Obviously, there's more work to do, for example on your plat and other, later, plats the interior quarter section corner are numbered on the plat.
Digital Data

**Bureau of Land Management General Land Office Records**

- **Survey Plats and Field Notes**
  - search by county, land description, surveyor
  - search by location – township
  - search by identifier – a unique numeric code automatically assigned during document indexing, when the record is initially created

**Minnesota IT Services Geospatial Information Office**

- **Historic Plats**
  - **GLO Historic Plat Map Retrieval System**
Sometimes a different perspective is Useful