

Online Surveying FE 208
Lecture 19
Introduction to Public Land Survey

Learning Objectives for this Lecture

- 1. Understand the general history of the U.S. Public Land Survey System**
- 2. Have an understanding of the primary laws of importance in the PLSS**
- 3. Understand the general principles for stabilizing land lines**
- 4. Know the order of subdivision for townships**
- 5. Know how errors and convergence are accumulated**
- 6. Know how to sub-divide sections**
- 7. Know how to write a legal description for a section and sub-divided section**

U.S. Public Land Survey

Devised with the object of marking on the ground and fixing for all time legal subdivisions for the purposes of description and disposal of the public domain under the general land laws of the United States.

General Outline and History of the U.S. Public Land Survey System

- 1. Most of the U.S. is divided by the Federal Government into “sections” approx. 1 mile square except:**
 - The original 13 colonies
 - Texas
 - Kentucky
 - Tennessee
 - Those lands still belonging to the government
 - Forest reserves
 - Indian reservations
- 2. Rectangular system of survey inaugurated by the Continental Congress**
 - 1784 - “ordinance for ascertaining the mode of locating and disposing of lands in the western territory...” Jefferson
 - Ordinance passed in 1785

- 1785 Ordinance provided for....
 - Townships 6 miles square
 - Lines running north and south
 - Lines running at right angles to these
 - No allowance for convergence
 - 36 sections 1 mile square to the township

- Ordinance of 1788
 - Notes and plats a statutory requirement

- Act of 1796
 - Provides for the appointment of a Surveyor General
 - Rule for numbering sections was established as still practiced today

- Act of 1800
 - Original set public land corners held to be true
 - Provides for the subdivision of sections into 1/2 sections
 - Monuments set at 1/2 mile posts on N/S lines
 - No monuments required on 1/4 corners E/W
 - Provides for excess or deficiencies to be placed in the most northerly or westerly 1/2 miles of each township

- Act of 1805
 - Provides for the subdivision of sections into 1/4 sections
 - Provides for instructions on establishing and marking section corners and 1/2 and 1/4 corners as equidistant

- 1812 - General Land Office established

- 1831 - Detailed instructions for surveyors issued. Precursor to the Manual of Surveying Instructions

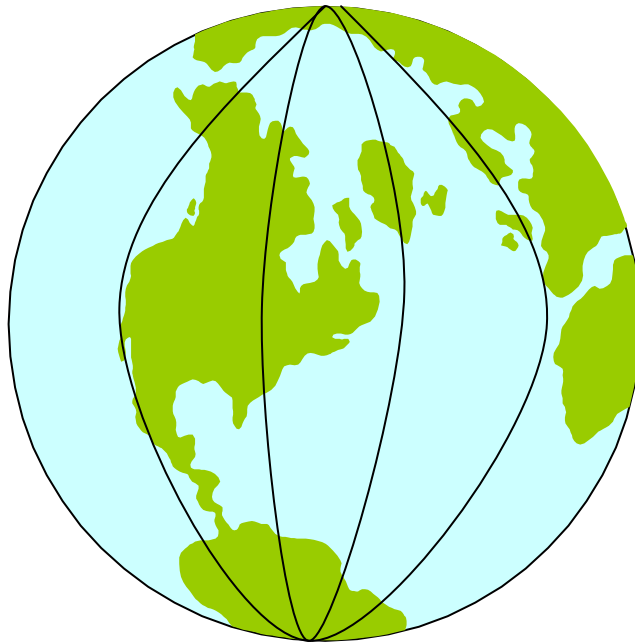
- 1849 - Department of Interior established

- 1851 - “Instructions to the Surveyor General of Oregon; Being a Manual for Field Operations”. The immediate forerunner to the Manual.
- Act of 1909
 - Resurveys may be made at the discretion of the Secretary of Interior for undisposed lands

Stated rules of survey

“The public lands shall be divided by north and south lines run according to the true meridian, and by others crossing them at right angles, so as to form townships six miles square....”

Does not account for convergence of meridians



Since it is not possible to have all true 6 mile townships, a fairly elaborate system for subdivision of public lands resulted

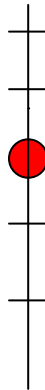
Principles for stabilizing land lines

- The boundaries of public lands established by duly appointed surveyors are unchangeable
- Original township and section corners established by surveyors must stand as the true corners they were intended to represent, whether or not in the place shown by the field notes

Initial point - 37 initial points set astronomically

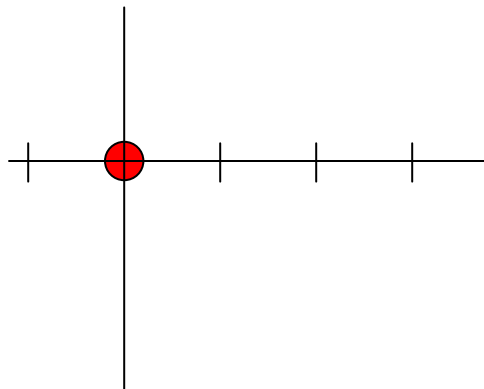


Principal meridian – a true north –south line run to the limits of the area.



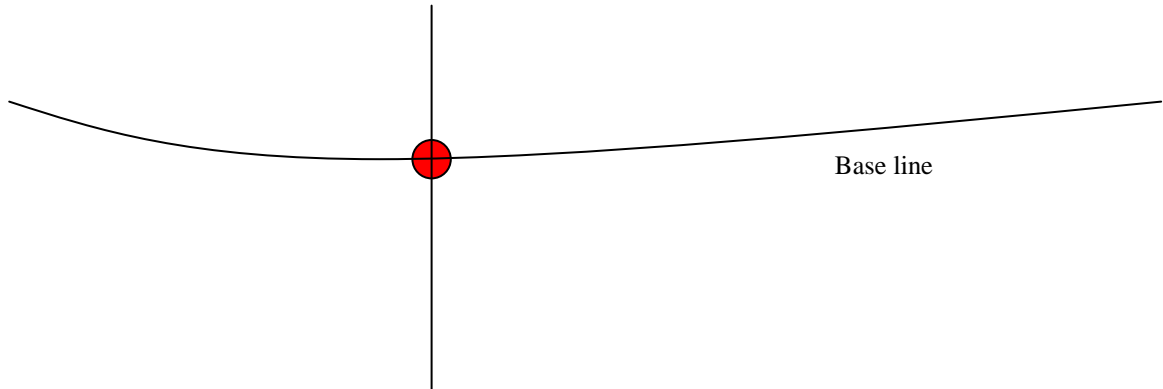
Principle meridian

Base Line – a line of true parallel running east-west to the limits of the area.



Base line

Because the base line follows the true parallel, it is actually an arc of a great circle.

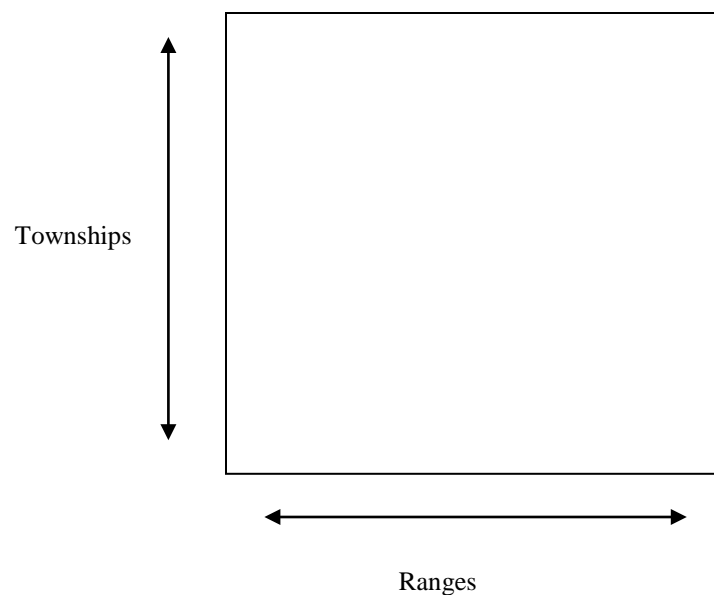


Guide meridian – A true north line run at each 24 mile interval along the base line. Guide meridians are numbered consecutively east-west of the principle meridian.

Designation of a township

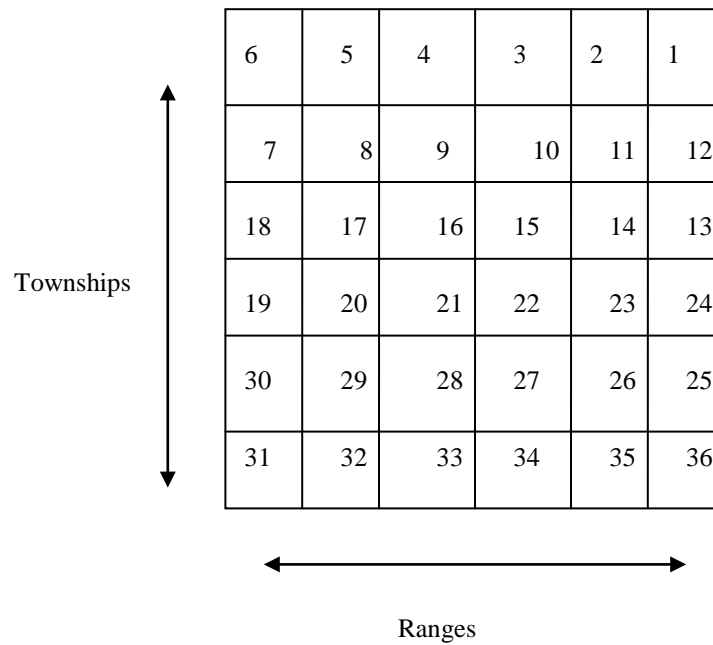
North-south rows are designated as ranges. Numbering is based from the principal meridian.

East-west rows are designated as townships. Numbering is based from the base line

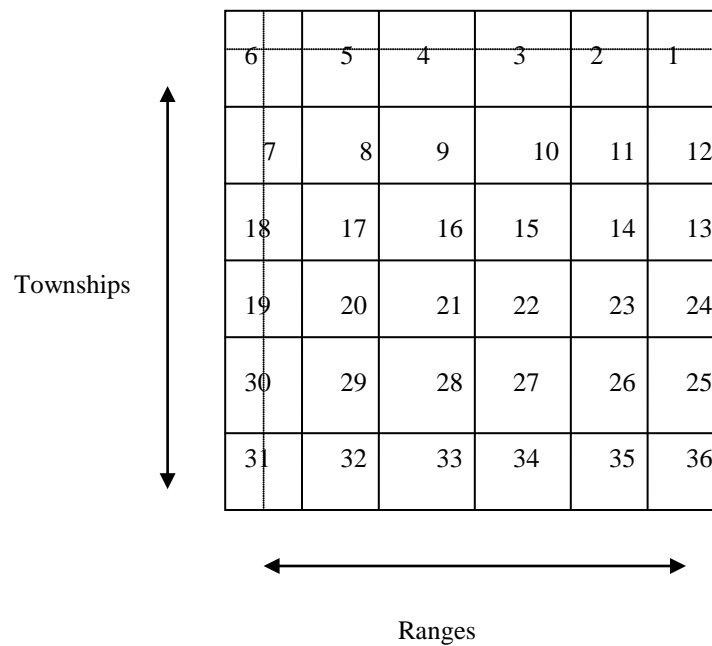


Subdivision of townships into sections

Townships are normally divided into 36 sections each approximately 1 mile on a side



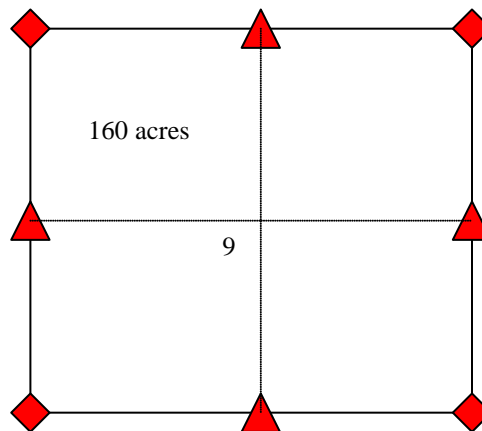
All errors and convergence are accumulated in the western and northern half sections



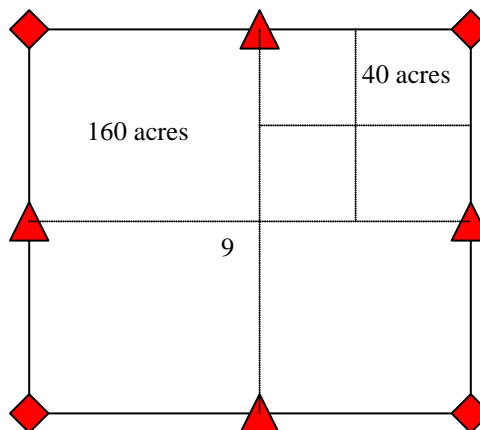
Subdivision of sections

Sections are normally subdivided as follows:

- Straight lines are run from the opposite $\frac{1}{4}$ corners to establish $\frac{1}{4}$ sections
- Approximately 160 acres

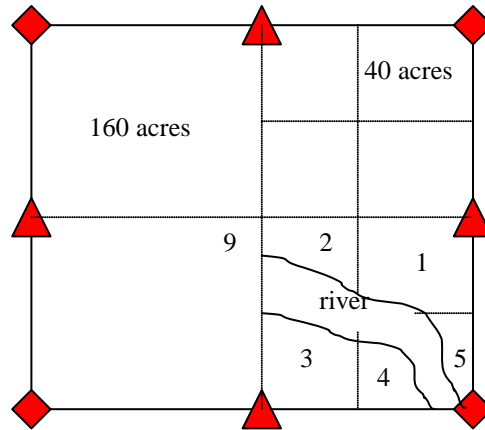


- Straight lines are run from the opposite $\frac{1}{4}$, $\frac{1}{4}$ corners to establish $\frac{1}{16}$ th sections
- Approximately 40 acres



Fractional sections

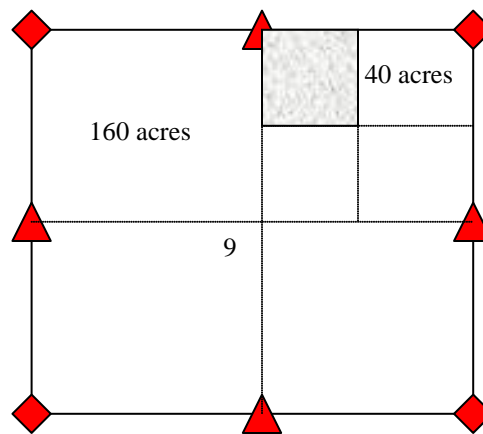
Sections made fractional by rivers or lakes or other bodies of water, and those made irregular by the measurement discrepancies along the north and west boundaries of the township. These are given lot numbers.



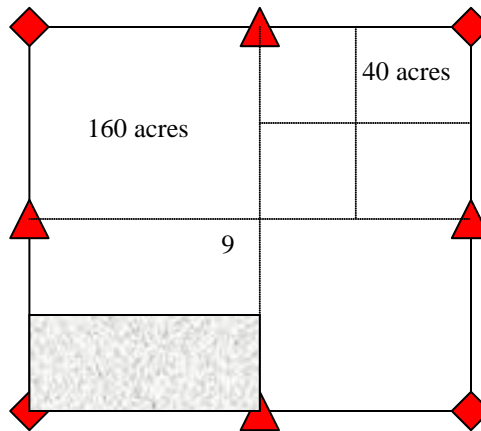
Legal Description

Begin at the smallest unit and work upward, including the section, township, range, and meridian.

Examples:



NW $\frac{1}{4}$, NE $\frac{1}{4}$, SEC. 9, T12S, R2E, W.M.



S 1/2, SW 1/4, SEC. 9, T12S,R2E, W.M.

Origin, township, and section components of the Public Land Survey System.

T2N R3E

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

NW 1/4, NE 1/4, Section 17

NW 1/4	NW 1/4 NE 1/4	NE 1/4 NE 1/4
	SW 1/4 NE 1/4	SE 1/4 NE 1/4
N1/2 SW 1/4	W1/2 SE 1/4	E1/2 SE 1/4
S1/2 SW 1/4		

