


Systems Theory


- A methodological/philosophical approach
- System?
 - ☒
- Process?
 - ☒



See Focus Study 1.1 on the Scientific Method

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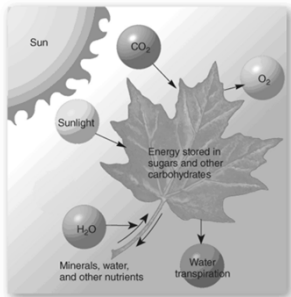
Systems Theory



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Systems Theory

An Open System

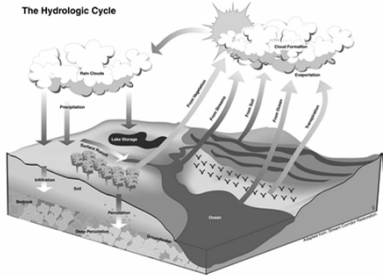


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Systems Theory

A Closed System


The Hydrologic Cycle




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System Theory

Negative Feedback




Positive Feedback



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System Theory



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Mount Pinatubo—Global System Impact

GLOBAL IMPACTS OF MOUNT PINATUBO ERUPTION—JUNE 15, 1991

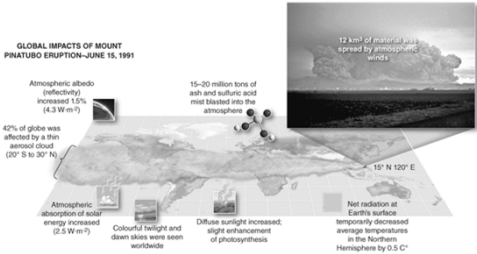


FIGURE 1.8 The eruption of Mount Pinatubo.
The 1991 Mount Pinatubo eruption affected the Earth-atmosphere system on a global scale. Geographers and other scientists use the latest technology to study how such eruptions affect the atmosphere's dynamic equilibrium. A summary of the impacts is in Chapter 12. [Inset photo by Dave Harlow, USGS.]

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Models

A = RKLSCP

FIGURE 63
Structure of SLEMSA (Swell 1981)

PHYSICAL SYSTEMS

CRDP	CLIMATE	SOIL	TOPOGRAPHY
Energy Interactions	Radiant Energy	Soil Chemistry	Soil Structure
E	E	F	S
C	K	N	X
Control Factors	Soil Use	Soil Use	Topographic Form
C	K	N	X
Soil Use from Soil Use and Structure			
$Z = KDX$			

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Geodesy?

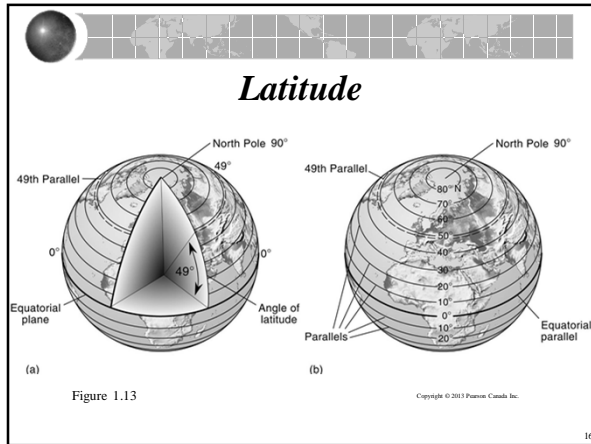
Science that deals with measuring the size and shape of Earth

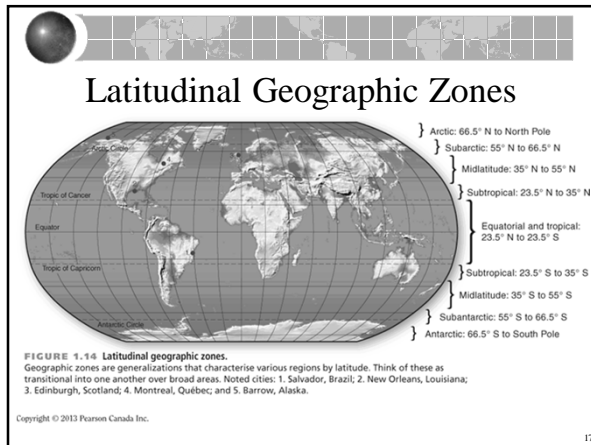
14

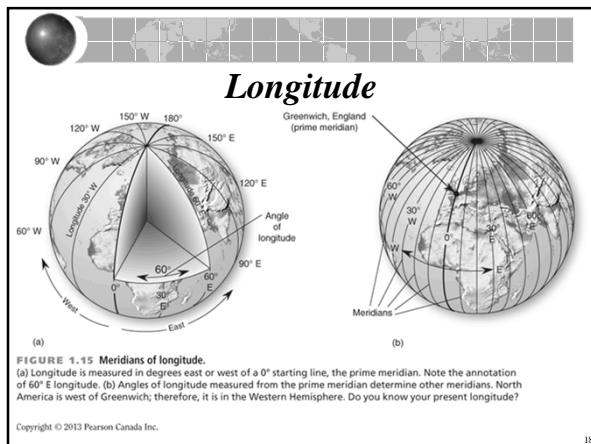
Location, Location, Location

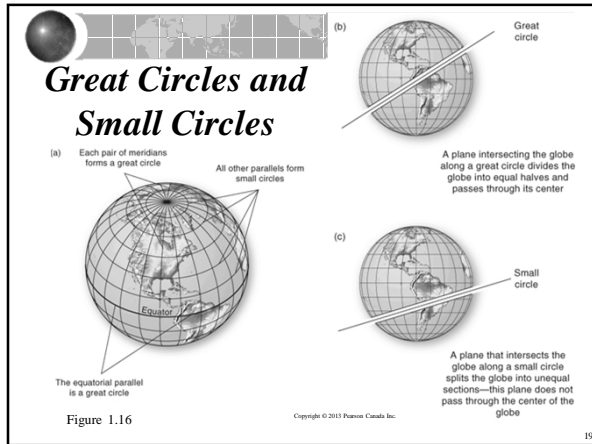
15

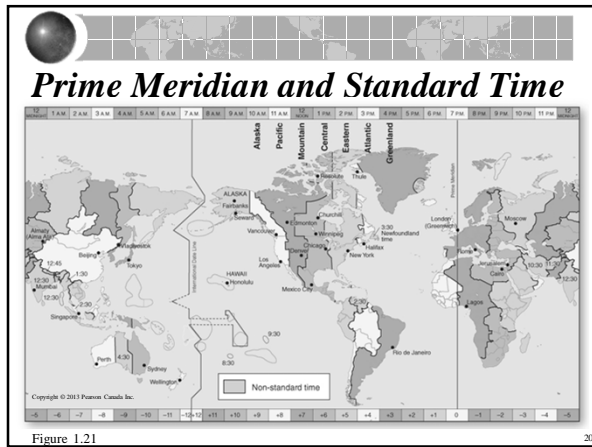
Intro Physical Geography Topic 1

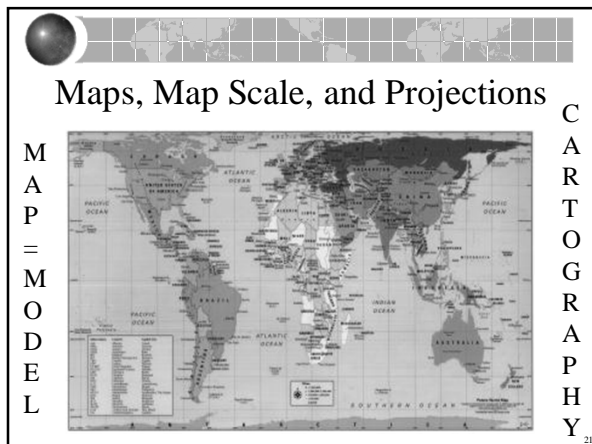













Map Scale

Representative fraction
1:250 000 or $\frac{1}{250\,000}$

Graphic scale



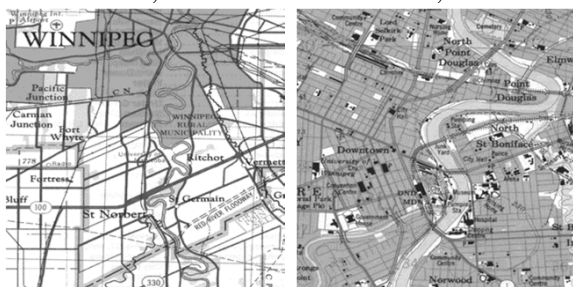
Written scale
One centimetre equals 2.5 kilometres

Indicates the amount of reduction

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The Right Scale

1:250,000 1:50,000



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Projecting a Globe on to a Flat Map

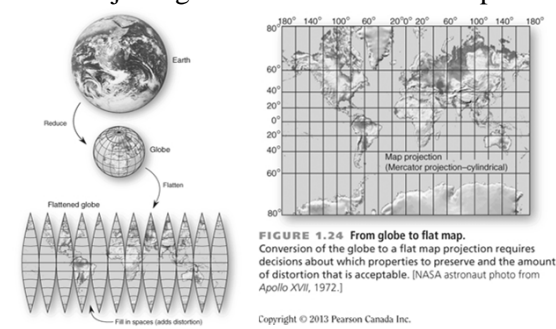
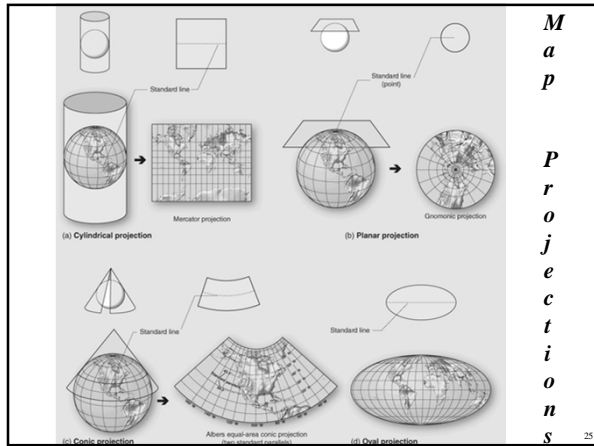
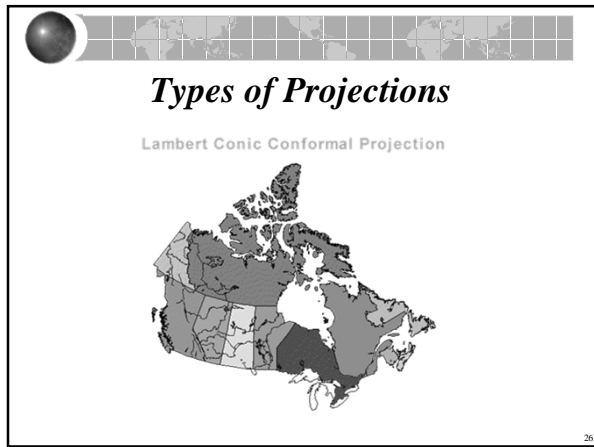


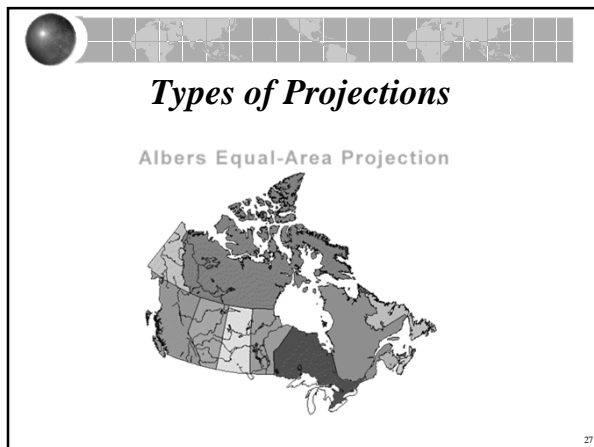
FIGURE 1.24 From globe to flat map. Conversion of the globe to a flat map projection requires decisions about which properties to preserve and the amount of distortion that is acceptable. [NASA astronaut photo from Apollo XVII, 1972.]

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Types of Projections

Equidistant Cylindrical Projection

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CLSS

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Township (Canadian)

Range 8W

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

Township 13

Section (640 acres)

13	14	15	16
12	11	10	9
5	6	7	8
4	3	2	1

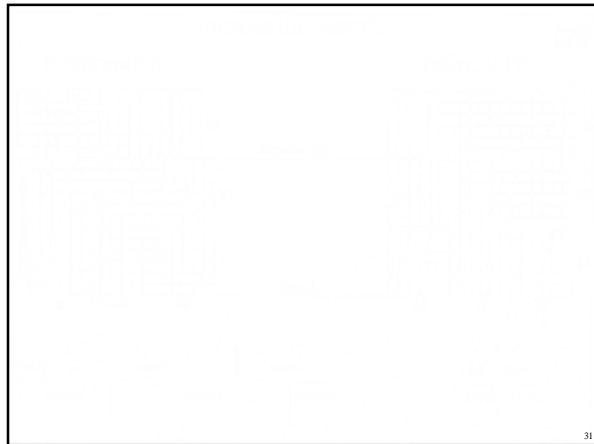
Quarter section (160 acres)

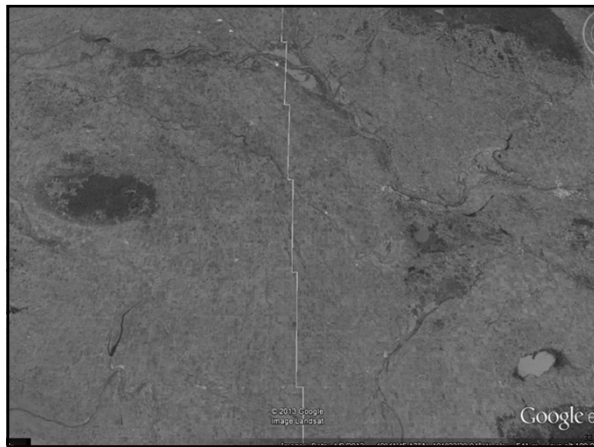
NW	NE
SW	SE

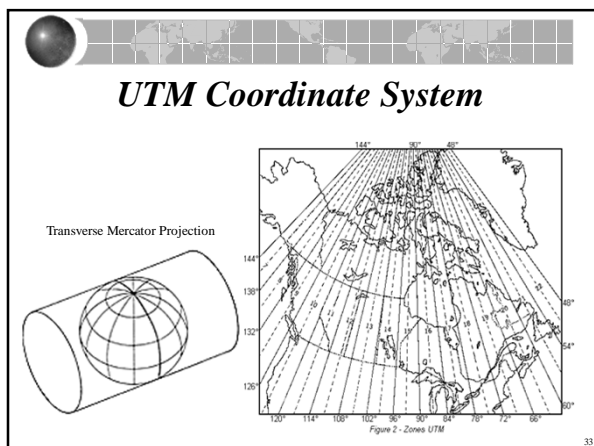
Quarter of legal subdivision (10 acres)


SE7, Tp13, R8, W1 SW1s8, Sec12, Tp13, R8, W1

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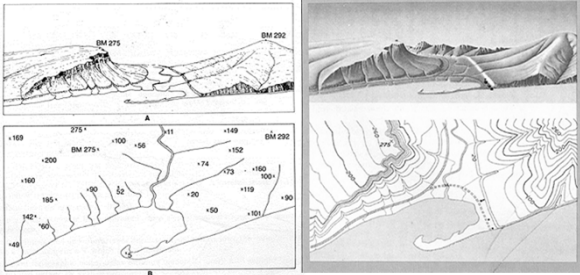






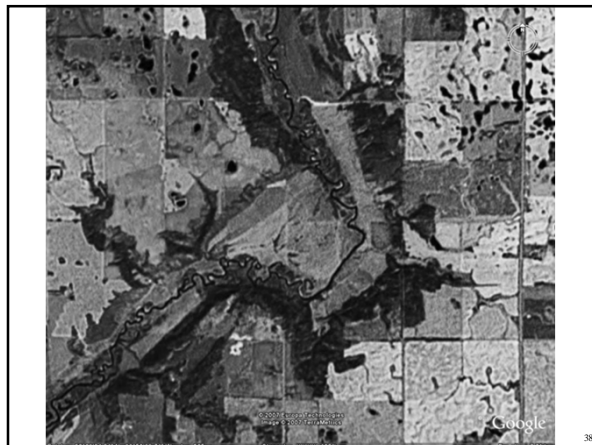
A decorative header for the slide featuring a globe icon on the left and a grid pattern on the right.

Contour Lines

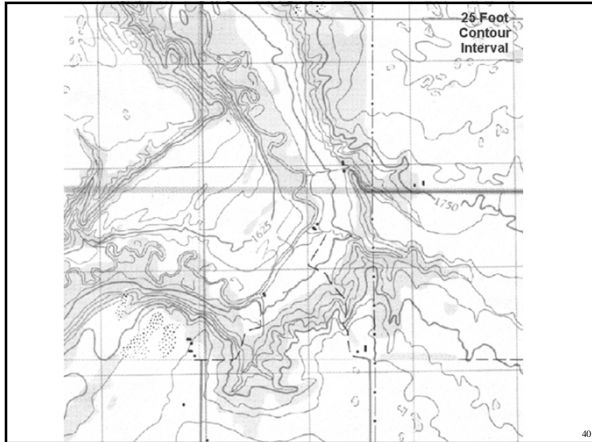
The slide contains two main visual components. On the left is a topographic map showing contour lines with numerical values such as 100, 150, 200, 250, and 300. It includes a cross-section line 'A' and a benchmark 'BM 275'. On the right is a 3D perspective view of a terrain with contour lines overlaid, showing how the lines represent elevation changes.

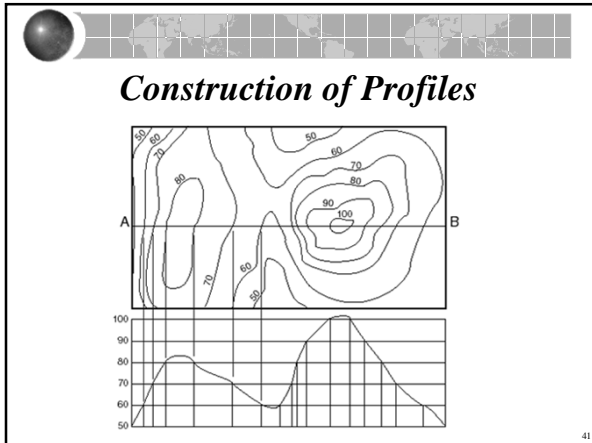
A special type of isarithmic line; indicate constant value

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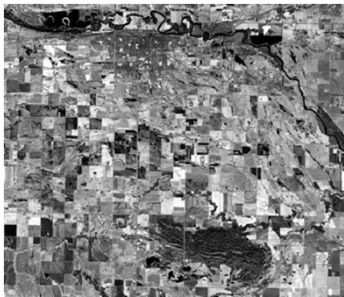
Remote Sensing

Collection and analysis of information without direct contact

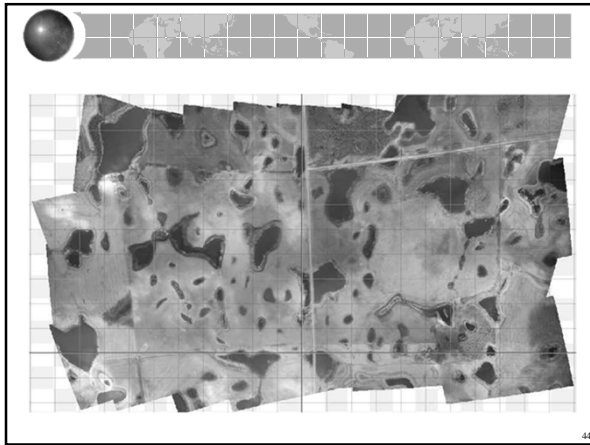
What does a RS system consist of?

Passive vs. active

Advantages?








Geographic Information Systems

A computer systems for managing, analyzing, and displaying spatial information

Map and attribute info

Advantages?

The diagram shows a stack of seven layers representing different data types in a GIS. From top to bottom, the layers are: Topographic base, Parcels, Zoning, Floodplains, Wetlands, Land cover, and Soils. Below these layers is a 'Satellite imagery' layer. The entire stack is labeled 'Composite overlay of all data layers' at the bottom right. A small number '45' is in the bottom right corner.




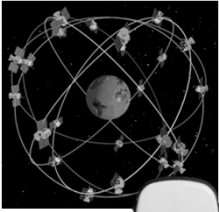
GNSS

Satellite based navigation system

What is it made up of?

How does it work?

Sources of error include:



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