Map Layout

- A Brief History of Cartography
- Sample Maps
- ArcGIS Layout Exercise

MIT - 1.963: Environmental Engineering Applications of GIS

9/20/04

Credits : Christian Adams

A History of Cartography – First Maps

- 6200BC -Catal-Hyuk Map – Wall Painting
- Assyria – map of Mesopotamia (2500 B.C.) on a clay tablet. (interpretation)
- 600BC - Babylonia – first map with world surrounded by the sea and heavenly bodies (interpretation)
- 6th century B.C. - first Greek map ascribed to Anaximander – no details survive
- Plato – first to put earth as sphere- 400BC
- Erasthosthenes- 250BC-measures the Earth's circumference accurately – concept of grids
- 450 BC - First Map in western literature: Herodotus

Ancient – Middle Ages

- Eskimos in Canadian Arctic
- *Bedouin tribesmen in Arabian desert*
- *South Asia – 8 to 6th B.C.*

Middle Ages and Renaissance

- World Exploration – Europe,Asia,N.Africa
- World Map - Fra Mauro ,Venice (1447)
- 1st Atlas – 'Geography Bologna' (1477)

Exploration of the Americas

◆ Columbus 'discovers' Americas (1492)

◆ "America" (1562) – Diego Gutierez

◆ Mercator's world map (1569)

◆ Rational Revenue assessment system in Raja Todarmal, based on surveyed holdings (1571)

◆ *Mexico City (1597) from the German Sebastian Meunster's Cosmographia Universalis*

◆ *NE Coast (1607) – Champlain*

◆ Galileo draws Sun centered universe (1609)

History (continued)

- *Jerusalem (1660's)*
- Royal Observatory at Greenwitch established (1675) – prime meridian
- *New England (1685) – Dutch*
- *Nova Scotia (1771)*
- *Upper Missouri Basin (1882) – Indians'*

Big Steps

- Work starts on the Great Trigonometrical Survey of India (1802)
- First photos from a plane (1908)
- Sydney (1922) Robinson's Aeroplane Map
- Sputnik (1957), NASA (1958)
- ArcInfo (1981) –ESRI

Design & Layout

- ◆ Intended Audience
  - ■ multiple designs are possible!
- ◆ Map Purpose, Intended Message
  - ■ visual hierarchy of map elements
  - ■ appropriate projection
  - ■ judicious use of decorations (don't diminish content)
- ◆ Media, Resolution, and Viewing Distance
  - ■ adjust type and line sizes to suit
  - ■ adjust colors to media & test maps in final media
- ◆ Design
  - ■ balance empty spaces in layout
  - ■ avoid unthinking use of boxes around map elements
  - ■ refine alignment to clean up map design
  - ■ experimentation and critique in improving design

Elements of a Map

- Main Map View
- Locator Map
- Title and Subtitles
- Legends
- Scale Indicator
- Orientation Indicator
- Graticule

- Explanatory Text
- Source Note
- Neatlines
- Projection info
- Publisher, year, etc.
- Charts, Tables, Photos & Graphs
- Lables

National Parks - Great Smokey Mountains

- Carolina (1732)
- Carolinas (1861)
- Tennessee Roadless Areas (1979)
- Great Smokey Mountains Nat. Park USGS Quad (1964)
- Great Smokey Mountains Nat. Park Trail Map (1997)

National Parks - Grand Canyon

- Rio Colorado (1858) shaded relief
- USGS (1873)
- Panorama from Pt. Sublime (1882)
- Geology (1882)
- National Park (1926) relief

National Parks - Yellowstone

- [Geology (1878)](#)
- [Radar Mosaic (1968)](#)
- [Fire Damage (1988)](#)

United States Atlases

- 1870
  - River Systems
  - Rain
- 1880
  - Rainfall
- 1890
  - Railroad System
- 1970
  - General Reference
  - Precipitation
  - Monthly Precipitation

US Environmental Data

- Maine Coast Wetlands (1979) - NWI
- Irrigated Agricultural Land (1987)
- Water Withdrawls (1990) – 3D
- Impaired Waters – Texas
- Boston Population
  - Dots
  - Circles
  - Density

Baltimore Harbor

- Watershed Management Study
- SWMM Model
- Nonpoint Source Modeling
- Figures
  - Chapters 1-3
  - Chapters 4-5
  - Appendix C

Layout Exercises

◆ ESRI Virtual Campus
- Sign in and establish an account
- Penn State Edition: Cartographic Design
- First Module Free: Big Picture Design
- Hand in printouts for Extra Credit
- Other modules & courses available through MIT

◆ Lab Exercise 3
- Due next week
- Make it look professional!
- creative layout rewarded