Fundamentals of working with geographic data
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Agenda

• Maps vs. source data
• Data storage formats
  - Particularly geodatabase
• Conversion tools
A GIS *map* is a compilation of layers
Each *layer* is a representation of GIS data

South_America
- Cities
- Countries
- Rivers
Geographic Data (Geodata)

- Information about geographic locations that is stored in a format that can be used with a geographic information system (GIS).

- Can be stored in a
  - Geodatabase
  - Raster image
  - Tabular data such as dbf tables or Excel spreadsheets
  - Shapefiles
  - Other, e.g.
    - Computer aided design formats (AutoCAD DWG or Microstation DGN files)
    - GPS Exchange format (GPX)
GIS Web Services

• A GIS resource made available on the web
  - Map layers – Map Service, Feature Service
    - Feature access makes a feature service
  - 3D layers – Globe eservices
  - Address locators – Geocode service
  - Geodatabase connections – Geodata service

• Each Web service has a distinct HTTP location (URL)

• Can be hosted
  - On-premise ArcGIS Server server
  - ArcGIS Online,
  - Portal for ArcGIS
Geodatabase

- Native storage format of ArcGIS
- “Smart” storage container for data
  - Stores data as
    - Feature Classes / Feature datasets
    - Raster Datasets / Mosaic Datasets
    - Tables
  - Validates data through
    - Topologies
    - Attribute domains
    - Subtypes
    - Networks
    - Parcel Fabrics
    - Many more…
Demo

• Explore the source data of a map
  - View common geographic data storage formats in ArcGIS
Data Conversion

• **Editable data formats in ArcGIS**
  - Geodatabase feature classes
  - Shapefiles
  - dBase tables
  - Tables in any supported DBMS (e.g. SQL Server or Oracle tables)

• **Read only**
  - CAD datasets (e.g. DWG or DGN)
  - MS Access tables
  - Excel tables
  - Text, ASCII, or comma-separated value (CSV) files
  - Many more..
Demo

- Converting data formats
  - GPX to geodatabase
  - CAD to geodatabase
  - Table to Excel
  - CSV table of addresses to point feature class
Summary

• Each map layer references a source dataset
  - Source data can be feature classes (collections of points, lines, or polygons) or raster/image data

• ArcGIS supports a variety of data storage formats
  - Geodatabase and shapefiles are editable formats
  - There are many conversion tools to convert formats into one another
  - Tables of addresses / XY coordinates can easily be converted to points on the map

• The geodatabase is a “smart” storage format that allows for data validation and modeling
Questions?
Thank you...

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